Standard RIO 200/400/420 Loop Typicals

Hardware loop typical definitions are used when designing the instrument loops, which will be interfaced to the control system.

The standard interfacing methods to various field instruments are described. The purpose is to limit the number of standard instrument loops.

Document revisions

Rev.	Written by		Checked by		Approved by	
	Date	Sign.	Date	Sign.	Date	Sign.
A	23.03.04	HHO	24.03.04	TRK	24.03.04	TF
B	01.04.04	HHO	01.04.04	TRK	01.04.04	TF
C	26.04.04	HHO	15.10.04	TRK	15.10.04	TF
D	28.10.04	HHO	29.10.04	TRK	29.10.04	TF
E	02.11.04	HHO	03.11.04	MB	03.11.04	TF
F	13.06.05	CBM	20.06.05	TF	20.06.05	TF
G	31.10.08	AMK	31.10.08	DW	31.10.08	SG

The original signatures are recorded on the company's logistic data system.

Document history

Rev. A First version.

Rev. B Reference to drawing 507653 (RDO1001_1) added

Rev. C Reference to new drawings added

Rev. D Reference to new drawings added. Minor updates.

Rev. E Reference to drawing 508083 (RAOCV1000) added

Rev. F Added reference to RMP400 and drawings are revised due to RMP400

Rev. G Added reference to RCU501, RMP420, RDIOR420 and RSER200-4. New Loop Typical numbers

Abbreviations

ICS	Integrated Control System
K-Chief	Kongsberg Maritime Integrated Control System
K-Pos	Kongsberg Maritime Dynamic Positioning System
KM	Kongsberg Maritime
LNG	Liquefied Natural Gas
RCU	Remote Controller Unit
RIO	Remote Input Output
RMP	Remote Multi Purpose module

Table of contents

1 INTRODUCTION

The intent of this document is to describe the different loops possible to use when interfacing RIO-modules.

2 RIO MODULES

In general, all RIO modules are designed like the one shown below. The example shows a RAIC 400 module, built for 32 analog current inputs.

It should be noted that, to some extent RIO modules are overlapping each other with respect to IO interfacing. In particular this applies to RAIC 400, RAOC 400, RAIT 400 and RAIV 400. The mix of modules delivered for an Integrated system, will depend upon the signal mix, and will be determined during the engineering period.

2.1 Specifications

Module	Specifications	
	Channel Configuration	**Channel Capability**
RAIC 400	Channel 1 – 32: current inputs, 4-20mA	1A Short-circuit proof high side driver (HSD), Max 30 V
RAOC 400	Channel 1 – 16: current inputs, 4-20mA Channel 17 – 24: analog outputs, individually defined as current or voltage Channel 25 – 32: voltage inputs,	Current Inputs: 1A Short-circuit proof high side driver (HSD), Max 30 V Voltage output: 0-10 V Current Output: 1A Short-circuit proof high side driver (HSD), Max 30 V Voltage input: ± 10 V
RAIV 400	Channel 1 – 32: analog inputs ± 10 V	± 10 V
RDIO 400 RDIO 401	Channel 1 – 32: individually defined as input or output	Digital input: 24V loop voltage, max 4 mA at 24 V loop voltage Digital output: 1A Short-circuit proof high side driver (HSD)
RDIO 401S	Channel 1 – 32: individually defined as input or output	Digital input: 24V loop voltage, max 4 mA at 24 V loop voltage Digital output: 0.5A Short-circuit proof high side driver (HSD)
RDIOR 400 RDIOR 401 RDIOR 420	16 channels individually defined as input or output 16 channels NO/NC contacts	Digital input: 24V loop voltage, max 4mA at 24V loop voltage Digital output (V): 1A Short-circuit proof high side driver (HSD) Digital output (Relay): Max 1A continuous current on contact sets
RAIT 400	16 channels (1–16) 2 or 3 wire Pt100. 16 channels (17-32) current input 4-20mA.	Current Inputs: 1A Short-circuit proof high side driver (HSD), Max 30 V
RMP 400 RMP 420	Channel 1-32: individually defined as input or output.	Voltage input: 0-4V, 0- 10V Current input/output: 0- 20mA Voltage output: 0- 10V Digital output: 1A Short-circuit proof high side driver (HSD), Max 30 V
RMP 401S RMP 420S	Channel 1-32: individually defined as input or output.	Voltage input: 0-4V, 0- 10V Current input/output: 0- 20mA Voltage output: 0- 10V Digital output: 0.5A Short-circuit proof high side driver (HSD), Max 30 V

Module	Specifications	
	Channel Configuration	**Channel Capability**
RMP 200-8	Channel 1-5 and 7: individually defined as input or output. Common isolated. Channel 6 and 8:Individually isolated. Can not be used as DO	Voltage input/output: +/- 10V Current input/output: 0- 20mA Digital output: 0.1A Short-circuit proof high side driver (HSD), Max 30 V Potmeter input.
RCU 500	12 non-isolated serial lines 2 isolated serial lines (TBSS is normally used to provide isolation).	RS232 / RS422 Dual Profibus interface Single serial interface for redundancy network
RCU 501	8 Isolated link channel interfaces dedicated for connection to RSER 200-4. Totally 32 serial line channels	Dual Redundancy network interface Dual Profibus interface Dual RBUS interface Dual CANbus interface
RCU 510	16 DI/DO/AI/AO channels 4 DI/DO/AI channels 4 DO (Relay) channels 8 AI/AO (Volt) Channels 5 Non-isolated serial lines 2 Isolated serial lines (TBSS is normally used to provide isolation).	DI: Digital input: 24V loop voltage, max 4mA at 24V loop voltage DO: Digital output (V): 1A Short-circuit proof high side driver (HSD) Digital output (Relay): Max 1A continuous current on contact sets AI: $\pm$10V / 0 - 10V / 4-20mA AO: $\pm$10V / 0 - 10V / 4-20mA RS232 / RS422/ RS485
TBSS	4 channel isolated serial lines	RS232 / RS422 / Current Loop input
RSER 200-4	4 channel isolated serial lines	RS232 / RS422 / RS485 / NMEA0183

3 GALVANIC ISOLATION

In cases where an interface is made to a PLC system, special considerations should be made for analog signals. In such cases, galvanic isolation is required. Likewise, galvanic isolation will be installed on KM outputs in cases where a PLC system is in the other end. For outputs directly to field equipment like valves etc., signals will not be galvanically isolated.

For DP and navigation systems, all outputs will be isolated as default.

Kongsberg Maritime requires outputs from other vendors to be isolated.

Galvanic isolation of serial lines requires the use of TBSS or RSER200-4 module.

4 PULSE INPUTS

Pulse inputs can be connected directly to the RDIO 400 module. Preferably, the pulsing should be generated from a dry contact. The pulse frequency should be limited to 10 Hz. For other type of pulse inputs, contact KM for clarifications.

Pulse inputs for RMP400 and RMP420 must be limited to 10 kHz. Encoder input signals to RMP400 and RMP420 must be limited to 2,5 kHz

5 ATTACHED DRAWINGS

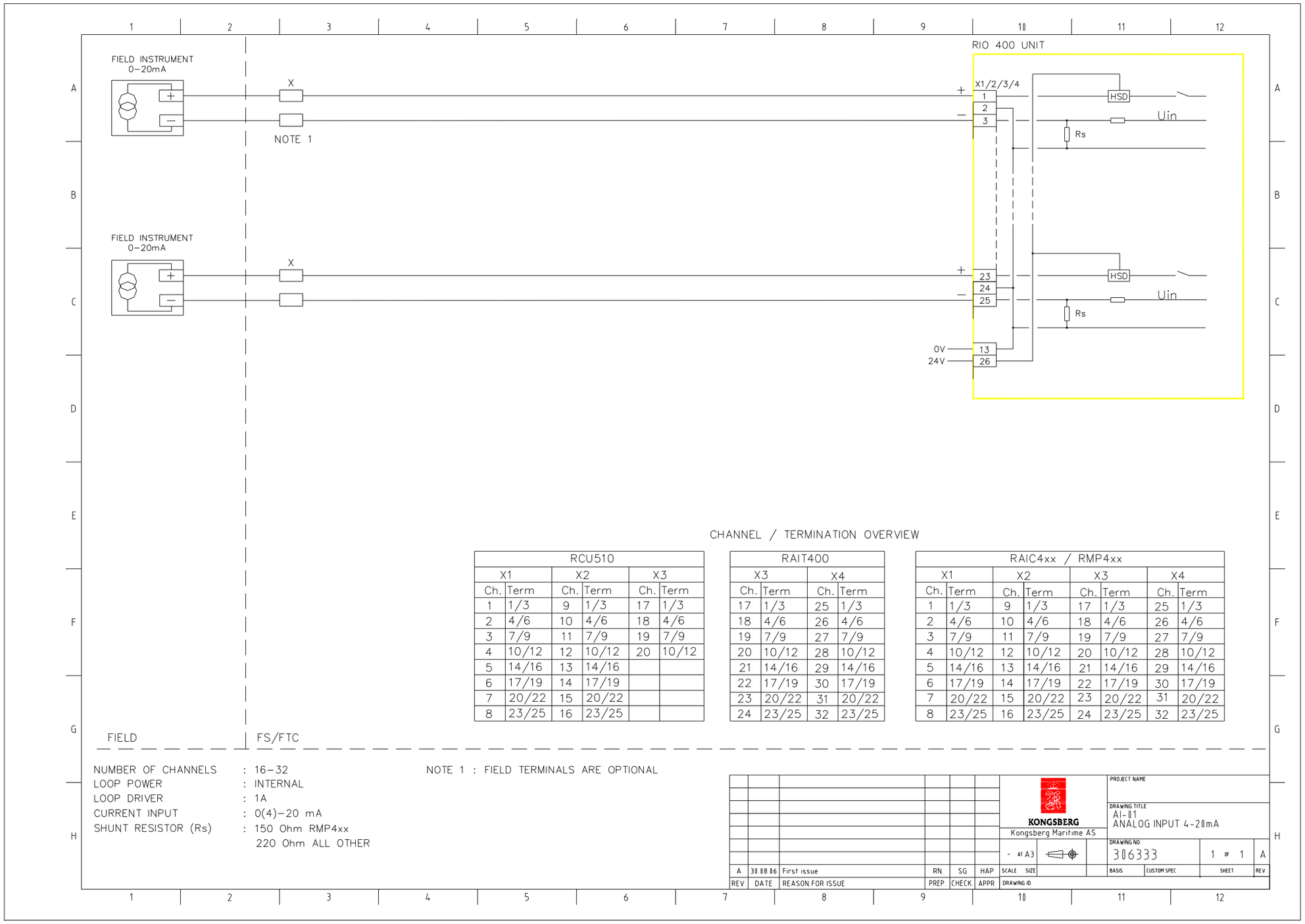
This document contains following drawings (latest revisions):

RIO 400/420 Loop Typicals		
Type	**Drw. No**	**Title**
AI-01	306333	Analog Input 4-20 mA
AI-02	306335	Analog Input 4-20 mA Ext.Pwr
AI-03	306337	Analog Input 4-20 mA, HART
AI-04	306338	Analog Input 4-20 Ma, HART Ext.Pwr
AI-05	306340	IS Analog Input 4-20 mA
AI-06	306341	IS Analog Input 4-20 mA HART
AI-09	306342	Redundant AI 4-20mA with HART
AI-10	306343	Redundant IS AI 4-20mA
AI-11	306344	Redundant IS AI 4-20mA with HART
AI-12	306345	Analog Input 3 Wire 4-20 mA
AI-13	306346	Analog Input 3 Wire 4-20 mA with HART
AI-14	306347	Redundant AI 4-20mA with HART
AI-15	306348	Analog Input RTD
AI-18	306351	IS1 Analog Input RTD
AI-19	306352	IS1 Analog Input TC
AI-20	306353	IS1 Analog Input 4-20mA
AI-21	306354	IS1 Analog Input 4-20mA Ext. Pwr
AI-22	306355	Analog Input RTD
AI-23	306326	HART to Analog Input 4-20mA Tri-Loop
AO-01	306356	Analog Output 4-20mA
AO-02	306358	Analog Output 4-20mA Ext.Powr.
AO-03	306359	Redundant Analog Output 4-20mA
AO-04	306360	Analog Output 4-20mA with HART
AO-05	306362	Redundant Analog Output 4-20mA with HART
AO-06	306363	Monitored Redundant AO 4-20mA
AO-07	306364	Monitored Redundant AO 4-20mA with HART
AO-08	306365	IS Analog Output 4-20mA
AO-09	306366	IS Analog Output 4-20mA with HART
AO-10	306367	IS1 analog Output 4-20mA
DI-01	306371	Digital Input
DI-02	306372	IS Digital Input
DI-03	306373	IS Digital Input
DI-04	306374	Redundant Digital Input
DI-05	306375	Redundant IS Digital Input
DI-06	306376	Redundant IS Digital Input
DI-07	306377	IS1 Digital Input
DI-08	306378	Digital input 3W, PNP - NPN
DI-09	322418	DI Common Return
DI-10	306380	Puls Input
DI-11	306381	IS Puls Input

RIO 400/420 Loop Typicals		
Type	**Drw. No**	**Title**
DO-01	306382	Digital Output
DO-02	306383	Relay Output (NO)
DO-03	306384	Redundant Digital Output
DO-04	306385	Digital Output
DO-05	306386	Redundant Digital Output
DO-06	307386	IS Digital Output
DO-07	307387	Redundant IS Digital Output
DO-10	307390	IS1 Digital Output
DO-11	307391	IS1 Digital Relay Output
DO-12	322648	Relay Output (NC)

RMP 200 Loop Typicals		
Type	**Drw. No**	**Title**
AI-100	307974	2 Wire, 4 - 20mA Differential External Power, RMP200
AI-101	307975	2 Wire, 4 - 20mA External Power, RMP200
AI-102	307977	2 Wire, 4 - 20mA Internal Power, RMP200
AI-103	307978	3 Wire, 4 - 20mA Internal Power, RMP200
AI-104	307979	2 Wire, +/-10V Differential External Power, RMP200
AI-105	307982	2 Wire, +/-10V External Power, RMP200,
AI-106	308052	2 Wire 0 - 10V Differential External Power, RMP200
AI-107	307983	2 Wire 0 - 10V External Power, RMP200
AI-108	307984	3 Wire +/-10V, 0 - 10V Internal Power, RMP200
AI-109	307985	2 Wire Potmeter Internal Power, RMP200
AI-110	307986	3 Wire Potmeter 18k Internal Power, RMP200
AI-111	307987	2 Wire Sin/Cos Triangle Potmeter Internal Power, RMP200
AO-100	307988	2 Wire 4 - 20mA Internal Power, RMP200
AO-101	307989	2 Wire +/-10V, 0 - 10V Internal Power, RMP200
DI-100	307990	2 Wire Internal Power, RMP200
DI-101	307991	2 Wire End-of-Line Resistance Internal Power, RMP200
DO-100	307992	2 Wire Internal Power, RMP200

Serial Line Loop Typicals		
Type	**Drw. No**	**Title**
SL-001	508077	TBSS
SL-100	308300	RS232/422/485/NMEA, RSER200



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3
2	4/6	10	4/6	18	4/6
3	7/9	11	7/9	19	7/9
4	10/12	12	10/12	20	10/12
5	14/16	13	14/16		
6	17/19	14	17/19		
7	20/22	15	20/22		
8	23/25	16	23/25		

RAIT400			
X3		X4	
Ch.	Term	Ch.	Term
17	1/3	25	1/3
18	4/6	26	4/6
19	7/9	27	7/9
20	10/12	28	10/12
21	14/16	29	14/16
22	17/19	30	17/19
23	20/22	31	20/22
24	23/25	32	23/25

RAIC4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3	25	1/3
2	4/6	10	4/6	18	4/6	26	4/6
3	7/9	11	7/9	19	7/9	27	7/9
4	10/12	12	10/12	20	10/12	28	10/12
5	14/16	13	14/16	21	14/16	29	14/16
6	17/19	14	17/19	22	17/19	30	17/19
7	20/22	15	20/22	23	20/22	31	20/22
8	23/25	16	23/25	24	23/25	32	23/25

NUMBER OF CHANNELS : 16–32
LOOP POWER : INTERNAL
LOOP DRIVER : 1A
CURRENT INPUT : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 150 Ohm RMP4xx
220 Ohm ALL OTHER

NOTE 1 : FIELD TERMINALS ARE OPTIONAL

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

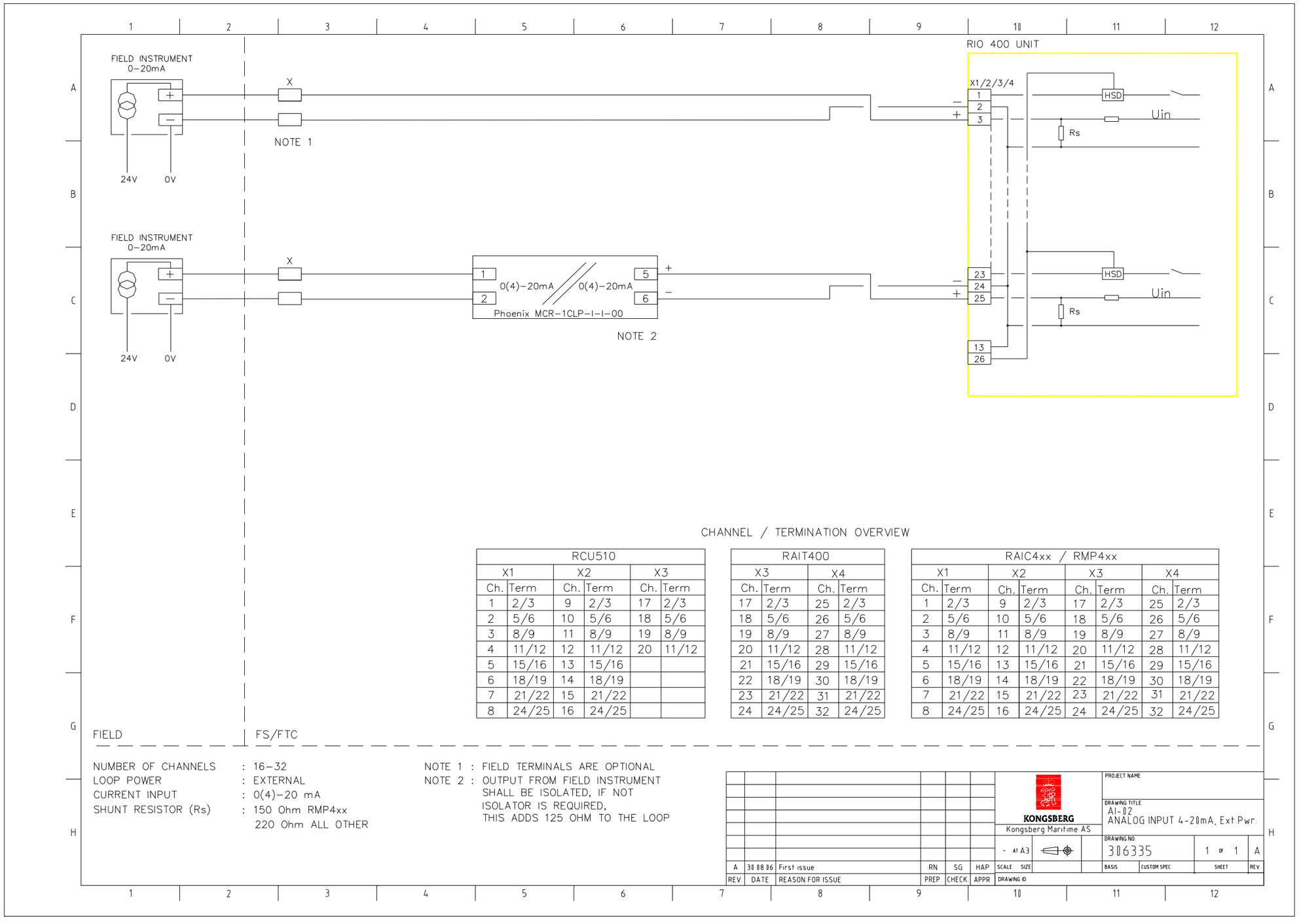
KONGSBERG
Kongsberg Maritime AS

PROJECT NAME

DRAWING TITLE
AI-01
ANALOG INPUT 4-20mA

DRAWING NO. 306333 | SHEET 1 OF 1 | REV. A

SCALE - AT A3 | BASIS | CUSTOM SPEC. | DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3
2	5/6	10	5/6	18	5/6
3	8/9	11	8/9	19	8/9
4	11/12	12	11/12	20	11/12
5	15/16	13	15/16		
6	18/19	14	18/19		
7	21/22	15	21/22		
8	24/25	16	24/25		

RAIT400			
X3		X4	
Ch.	Term	Ch.	Term
17	2/3	25	2/3
18	5/6	26	5/6
19	8/9	27	8/9
20	11/12	28	11/12
21	15/16	29	15/16
22	18/19	30	18/19
23	21/22	31	21/22
24	24/25	32	24/25

RAIC4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

FIELD | FS/FTC

NUMBER OF CHANNELS : 16–32
LOOP POWER : EXTERNAL
CURRENT INPUT : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 150 Ohm RMP4xx
220 Ohm ALL OTHER

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : OUTPUT FROM FIELD INSTRUMENT SHALL BE ISOLATED, IF NOT ISOLATOR IS REQUIRED, THIS ADDS 125 OHM TO THE LOOP

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

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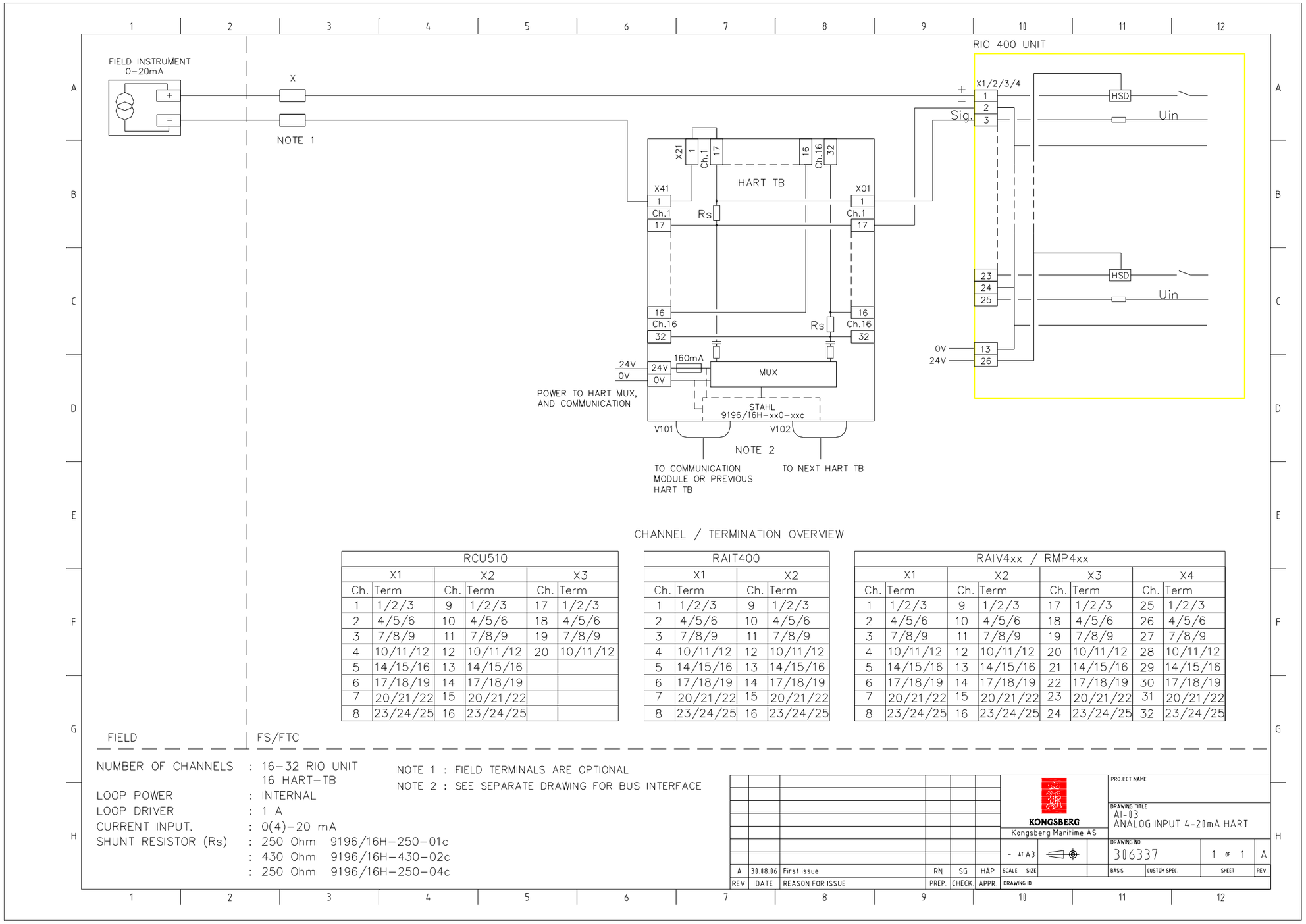
PROJECT NAME

DRAWING TITLE
AI-02
ANALOG INPUT 4-20mA, Ext.Pwr.

DRAWING NO.
306335

SCALE - AT A3 | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV. A

DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12
5	14/15/16	13	14/15/16		
6	17/18/19	14	17/18/19		
7	20/21/22	15	20/21/22		
8	23/24/25	16	23/24/25		

RAIT400			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3
2	4/5/6	10	4/5/6
3	7/8/9	11	7/8/9
4	10/11/12	12	10/11/12
5	14/15/16	13	14/15/16
6	17/18/19	14	17/18/19
7	20/21/22	15	20/21/22
8	23/24/25	16	23/24/25

RAIV4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3	25	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6	26	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9	27	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12	28	10/11/12
5	14/15/16	13	14/15/16	21	14/15/16	29	14/15/16
6	17/18/19	14	17/18/19	22	17/18/19	30	17/18/19
7	20/21/22	15	20/21/22	23	20/21/22	31	20/21/22
8	23/24/25	16	23/24/25	24	23/24/25	32	23/24/25

FIELD | FS/FTC

NUMBER OF CHANNELS : 16–32 RIO UNIT
16 HART–TB
LOOP POWER : INTERNAL
LOOP DRIVER : 1 A
CURRENT INPUT. : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 250 Ohm 9196/16H–250–01c
: 430 Ohm 9196/16H–430–02c
: 250 Ohm 9196/16H–250–04c

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

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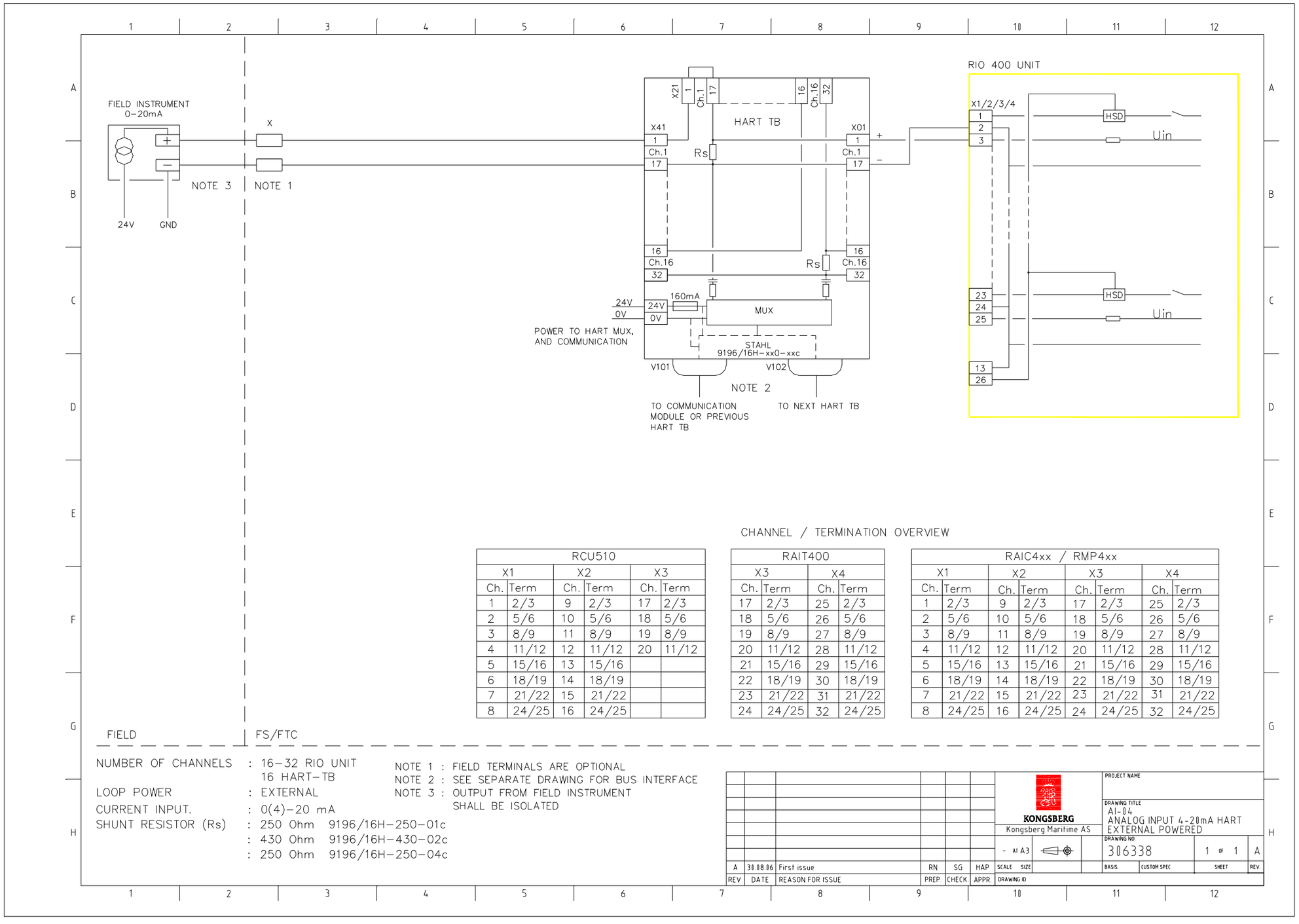
PROJECT NAME

DRAWING TITLE
AI-03
ANALOG INPUT 4-20mA HART

DRAWING NO
306337

SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV A

DRAWING ID.



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3
2	5/6	10	5/6	18	5/6
3	8/9	11	8/9	19	8/9
4	11/12	12	11/12	20	11/12
5	15/16	13	15/16		
6	18/19	14	18/19		
7	21/22	15	21/22		
8	24/25	16	24/25		

RAIT400			
X3		X4	
Ch.	Term	Ch.	Term
17	2/3	25	2/3
18	5/6	26	5/6
19	8/9	27	8/9
20	11/12	28	11/12
21	15/16	29	15/16
22	18/19	30	18/19
23	21/22	31	21/22
24	24/25	32	24/25

RAIC4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

NUMBER OF CHANNELS : 16–32 RIO UNIT
16 HART–TB
LOOP POWER : EXTERNAL
CURRENT INPUT. : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 250 Ohm 9196/16H–250–01c
: 430 Ohm 9196/16H–430–02c
: 250 Ohm 9196/16H–250–04c

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE
NOTE 3 : OUTPUT FROM FIELD INSTRUMENT SHALL BE ISOLATED

REV	DATE	REASON FOR ISSUE	PREP	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

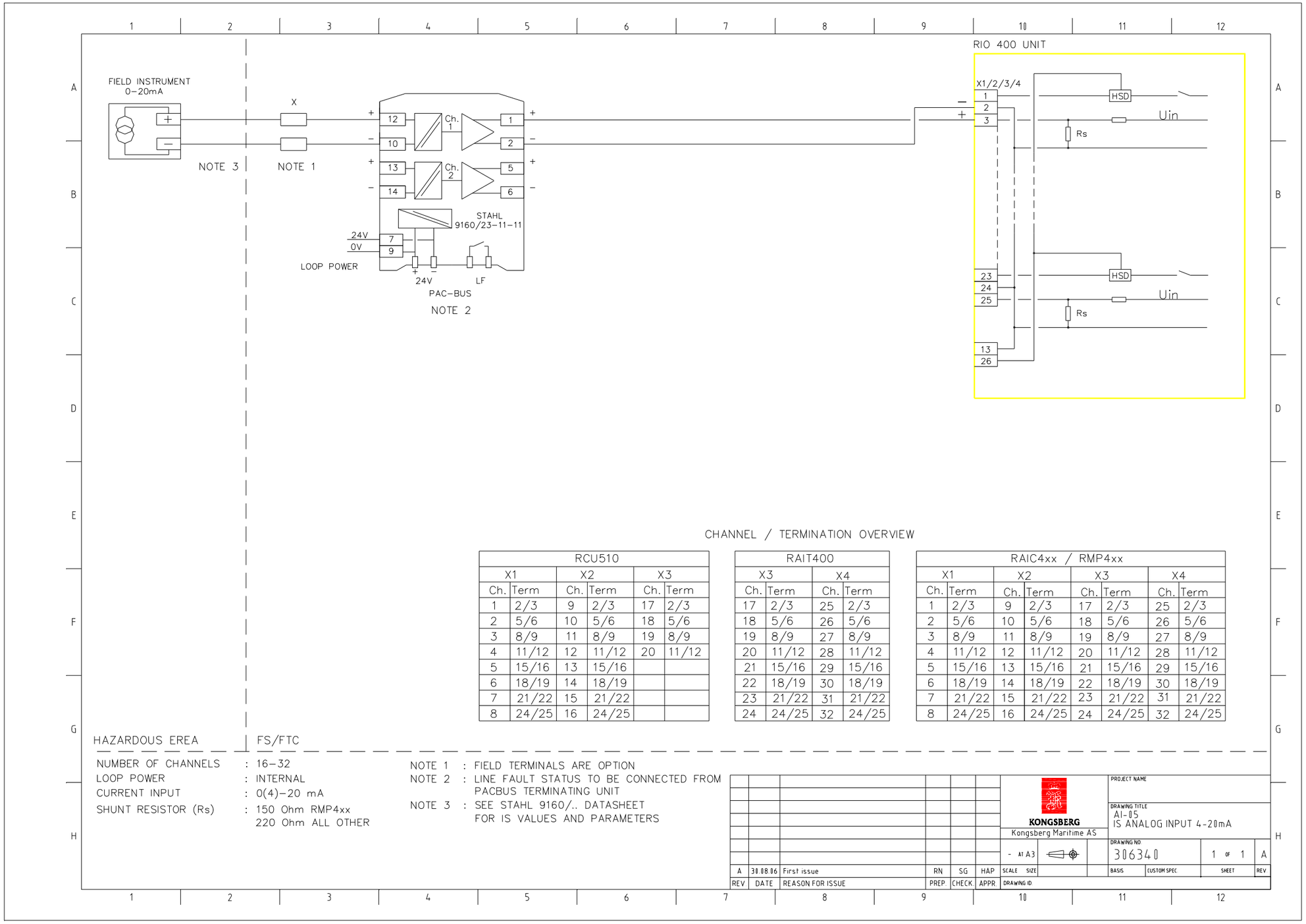
PROJECT NAME

DRAWING TITLE
AI–04
ANALOG INPUT 4–20mA HART
EXTERNAL POWERED

DRAWING NO 306338 | 1 OF 1 | A

SCALE – AT A3 | SIZE | BASIS | CUSTOM SPEC | SHEET | REV

DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3
2	5/6	10	5/6	18	5/6
3	8/9	11	8/9	19	8/9
4	11/12	12	11/12	20	11/12
5	15/16	13	15/16		
6	18/19	14	18/19		
7	21/22	15	21/22		
8	24/25	16	24/25		

RAIT400			
X3		X4	
Ch.	Term	Ch.	Term
17	2/3	25	2/3
18	5/6	26	5/6
19	8/9	27	8/9
20	11/12	28	11/12
21	15/16	29	15/16
22	18/19	30	18/19
23	21/22	31	21/22
24	24/25	32	24/25

RAIC4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

HAZARDOUS EREA | FS/FTC

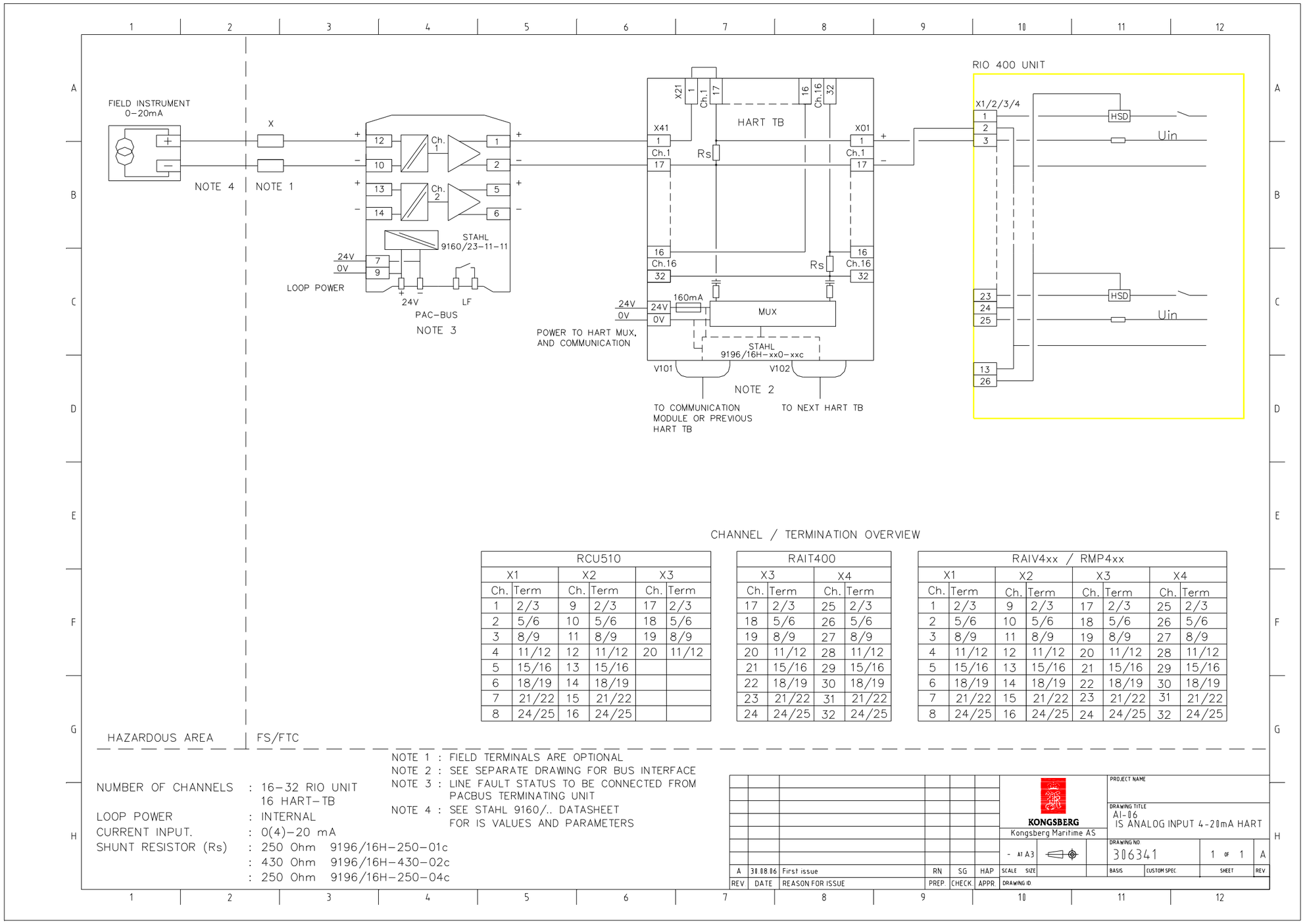
NUMBER OF CHANNELS : 16–32
LOOP POWER : INTERNAL
CURRENT INPUT : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 150 Ohm RMP4xx
220 Ohm ALL OTHER

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 3 : SEE STAHL 9160/.. DATASHEET FOR IS VALUES AND PARAMETERS

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: AI-05 IS ANALOG INPUT 4-20mA
DRAWING NO: 306340
SCALE: - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET: 1 OF 1 | REV: A
DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3
2	5/6	10	5/6	18	5/6
3	8/9	11	8/9	19	8/9
4	11/12	12	11/12	20	11/12
5	15/16	13	15/16		
6	18/19	14	18/19		
7	21/22	15	21/22		
8	24/25	16	24/25		

RAIT400			
X3		X4	
Ch.	Term	Ch.	Term
17	2/3	25	2/3
18	5/6	26	5/6
19	8/9	27	8/9
20	11/12	28	11/12
21	15/16	29	15/16
22	18/19	30	18/19
23	21/22	31	21/22
24	24/25	32	24/25

RAIV4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

HAZARDOUS AREA | FS/FTC

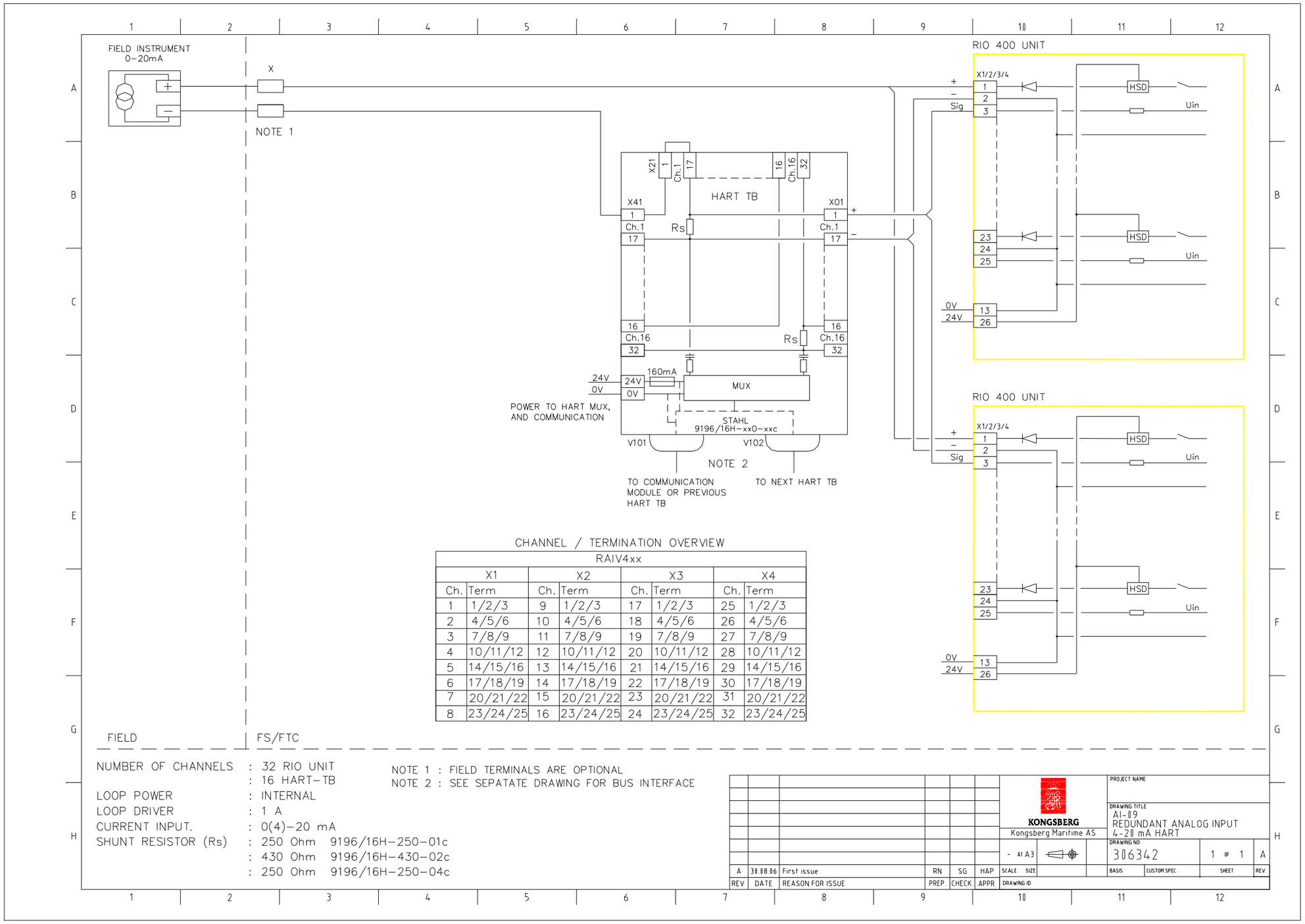
NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE
NOTE 3 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 4 : SEE STAHL 9160/.. DATASHEET FOR IS VALUES AND PARAMETERS

NUMBER OF CHANNELS : 16–32 RIO UNIT
16 HART–TB
LOOP POWER : INTERNAL
CURRENT INPUT. : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 250 Ohm 9196/16H–250–01c
: 430 Ohm 9196/16H–430–02c
: 250 Ohm 9196/16H–250–04c

REV	DATE	REASON FOR ISSUE	PREP	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

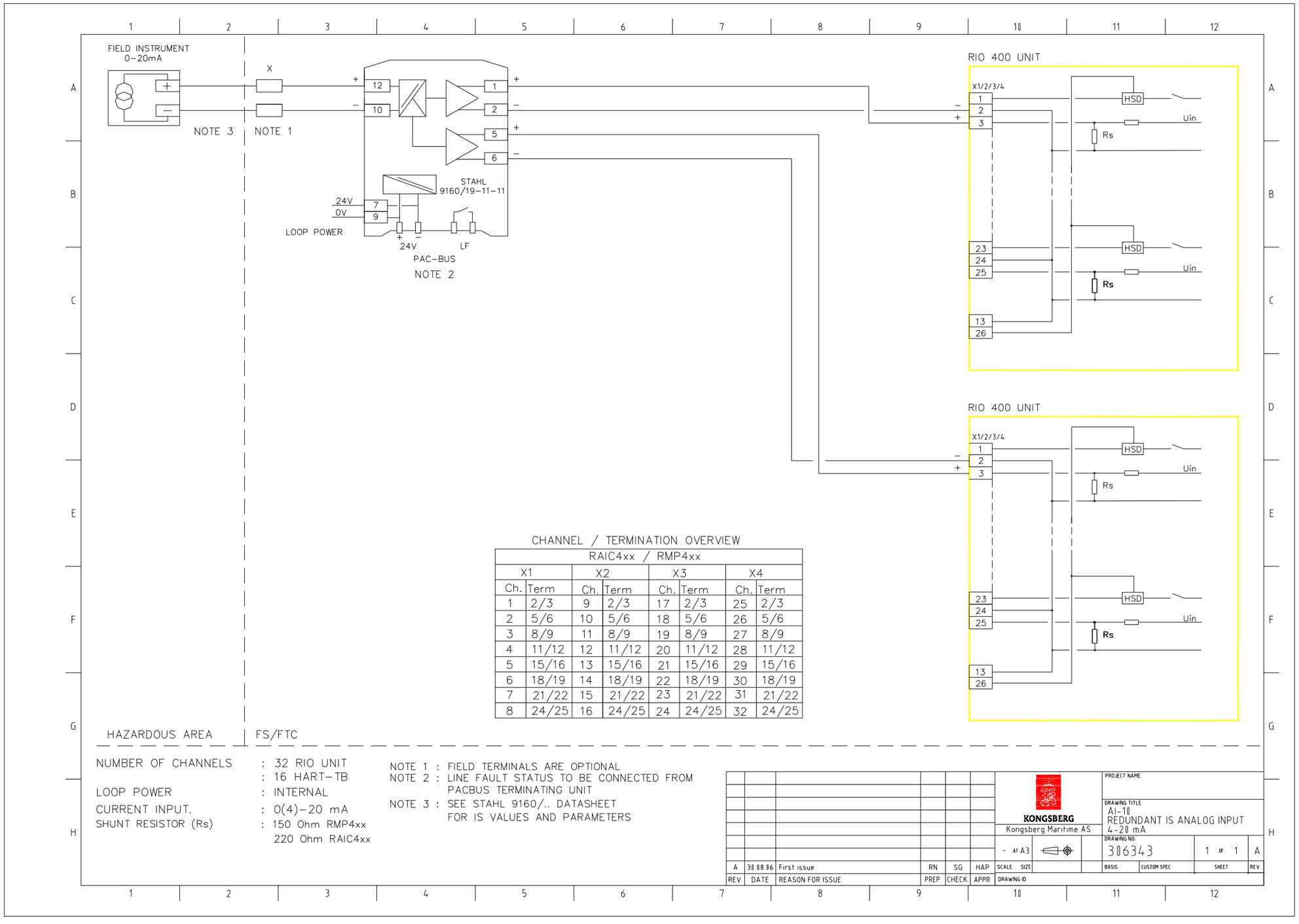
KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: AI–06 IS ANALOG INPUT 4–20mA HART
DRAWING NO: 306341
SCALE: - AT A3
SHEET: 1 OF 1
REV: A
BASIS | CUSTOM SPEC | DRAWING ID



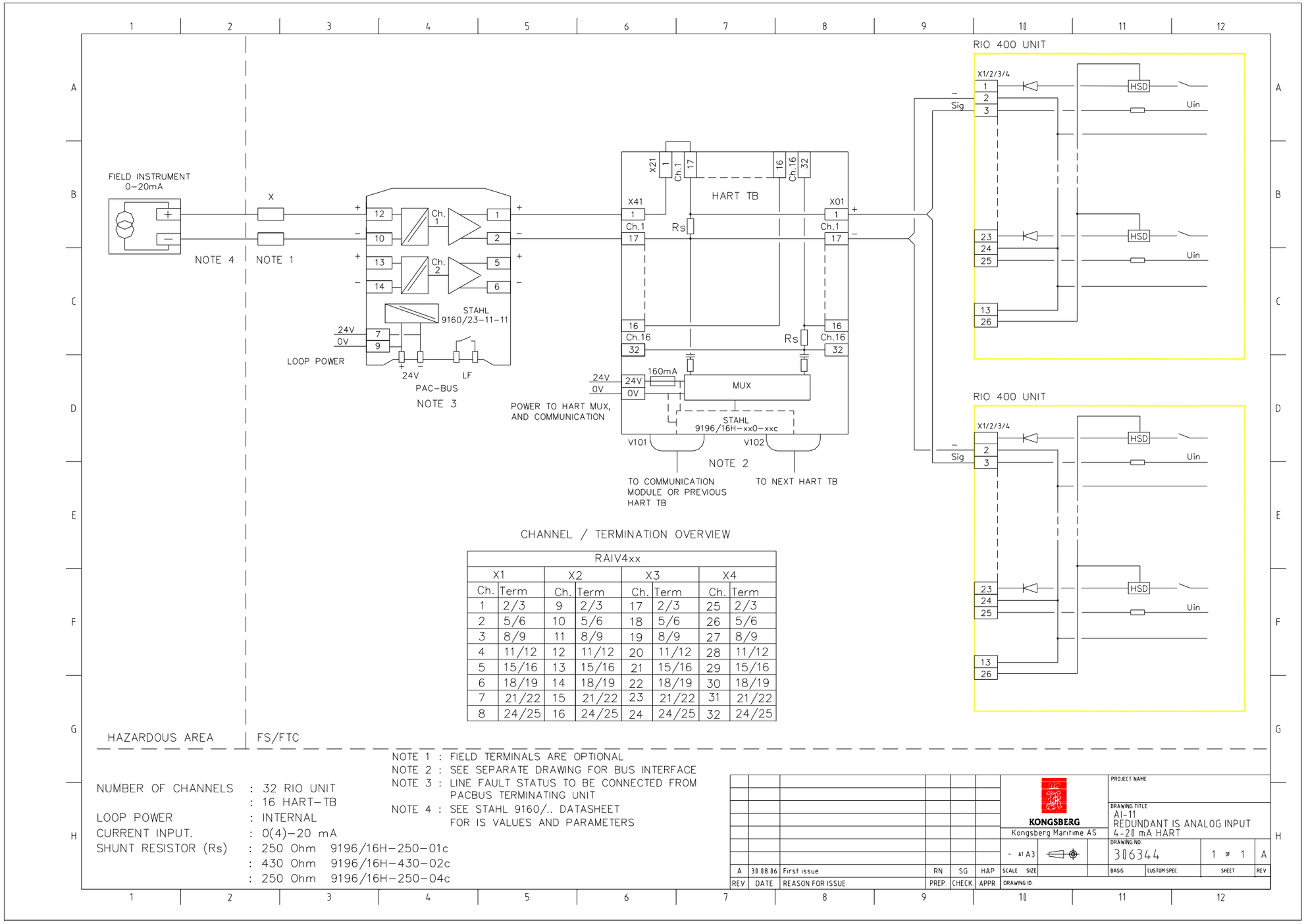
CHANNEL / TERMINATION OVERVIEW

RAIV4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3	25	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6	26	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9	27	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12	28	10/11/12
5	14/15/16	13	14/15/16	21	14/15/16	29	14/15/16
6	17/18/19	14	17/18/19	22	17/18/19	30	17/18/19
7	20/21/22	15	20/21/22	23	20/21/22	31	20/21/22
8	23/24/25	16	23/24/25	24	23/24/25	32	23/24/25



CHANNEL / TERMINATION OVERVIEW

RAIC4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25



CHANNEL / TERMINATION OVERVIEW

RAIV4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

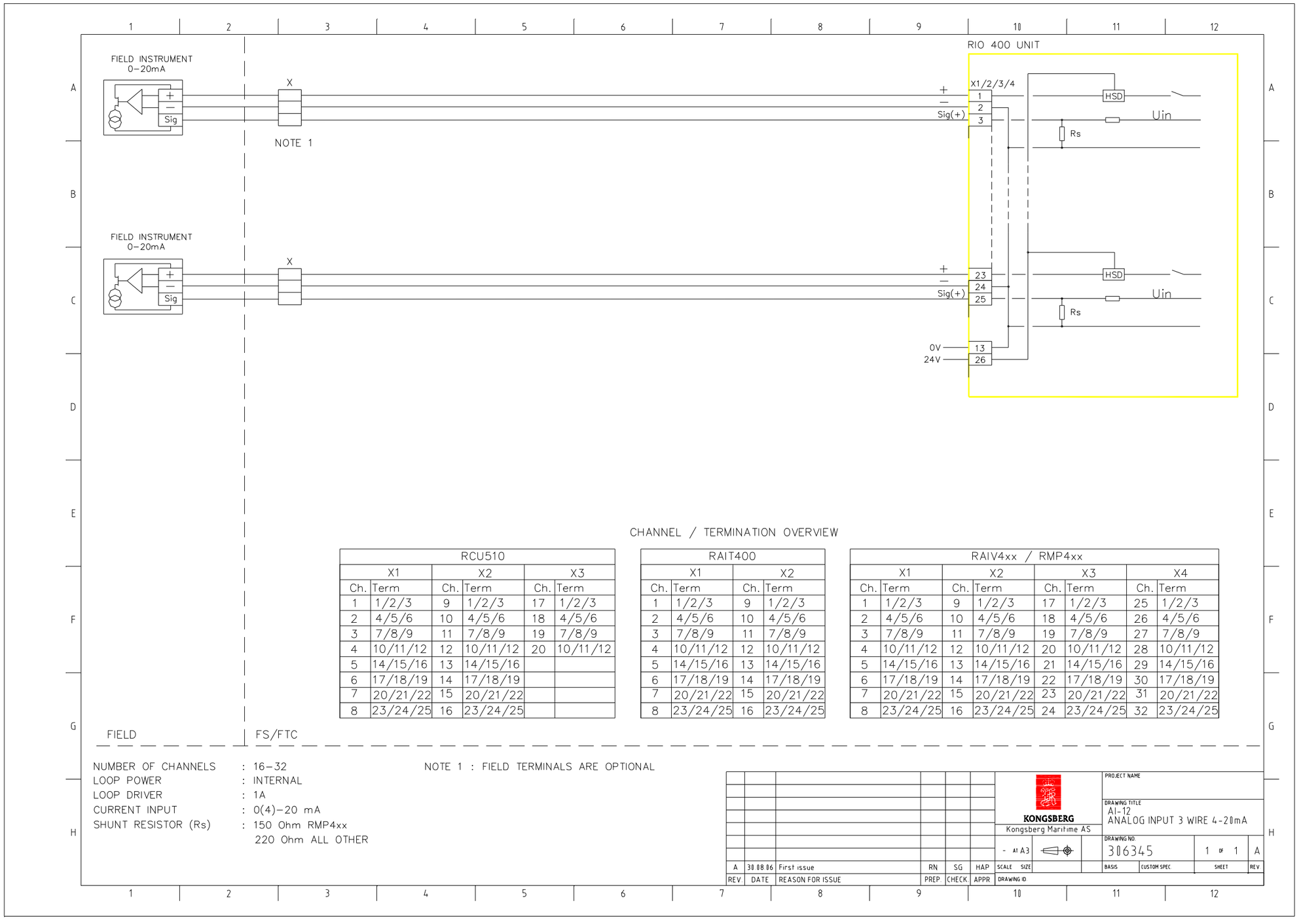
NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE
NOTE 3 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 4 : SEE STAHL 9160/.. DATASHEET FOR IS VALUES AND PARAMETERS

NUMBER OF CHANNELS : 32 RIO UNIT
: 16 HART–TB
LOOP POWER : INTERNAL
CURRENT INPUT. : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 250 Ohm 9196/16H–250–01c
: 430 Ohm 9196/16H–430–02c
: 250 Ohm 9196/16H–250–04c

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE
AI–11
REDUNDANT IS ANALOG INPUT
4–20 mA HART
DRAWING NO. 306344
SCALE – AT A3 | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV. A
DRAWING ID.



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12
5	14/15/16	13	14/15/16		
6	17/18/19	14	17/18/19		
7	20/21/22	15	20/21/22		
8	23/24/25	16	23/24/25		

RAIT400			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3
2	4/5/6	10	4/5/6
3	7/8/9	11	7/8/9
4	10/11/12	12	10/11/12
5	14/15/16	13	14/15/16
6	17/18/19	14	17/18/19
7	20/21/22	15	20/21/22
8	23/24/25	16	23/24/25

RAIV4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3	25	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6	26	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9	27	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12	28	10/11/12
5	14/15/16	13	14/15/16	21	14/15/16	29	14/15/16
6	17/18/19	14	17/18/19	22	17/18/19	30	17/18/19
7	20/21/22	15	20/21/22	23	20/21/22	31	20/21/22
8	23/24/25	16	23/24/25	24	23/24/25	32	23/24/25

NUMBER OF CHANNELS : 16–32
LOOP POWER : INTERNAL
LOOP DRIVER : 1A
CURRENT INPUT : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 150 Ohm RMP4xx
220 Ohm ALL OTHER

NOTE 1 : FIELD TERMINALS ARE OPTIONAL

REV.	DATE	REASON FOR ISSUE	PREP	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

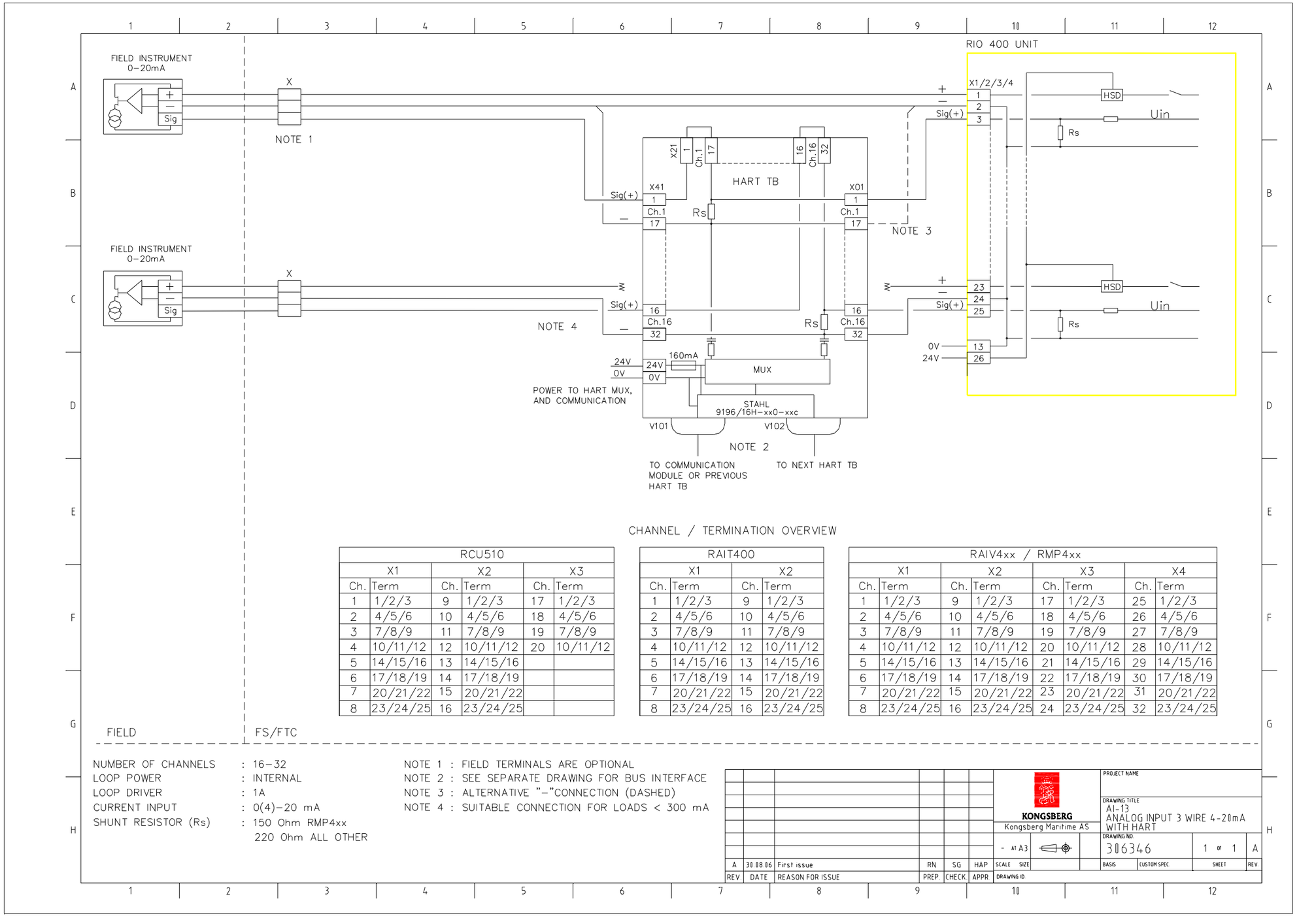
PROJECT NAME

DRAWING TITLE
AI-12
ANALOG INPUT 3 WIRE 4-20mA

DRAWING NO. 306345 | 1 OF 1 | A

SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET | REV.

DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12
5	14/15/16	13	14/15/16		
6	17/18/19	14	17/18/19		
7	20/21/22	15	20/21/22		
8	23/24/25	16	23/24/25		

RAIT400			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3
2	4/5/6	10	4/5/6
3	7/8/9	11	7/8/9
4	10/11/12	12	10/11/12
5	14/15/16	13	14/15/16
6	17/18/19	14	17/18/19
7	20/21/22	15	20/21/22
8	23/24/25	16	23/24/25

RAIV4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3	25	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6	26	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9	27	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12	28	10/11/12
5	14/15/16	13	14/15/16	21	14/15/16	29	14/15/16
6	17/18/19	14	17/18/19	22	17/18/19	30	17/18/19
7	20/21/22	15	20/21/22	23	20/21/22	31	20/21/22
8	23/24/25	16	23/24/25	24	23/24/25	32	23/24/25

FIELD | FS/FTC

NUMBER OF CHANNELS : 16–32
LOOP POWER : INTERNAL
LOOP DRIVER : 1A
CURRENT INPUT : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 150 Ohm RMP4xx
220 Ohm ALL OTHER

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE
NOTE 3 : ALTERNATIVE "–"CONNECTION (DASHED)
NOTE 4 : SUITABLE CONNECTION FOR LOADS < 300 mA

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

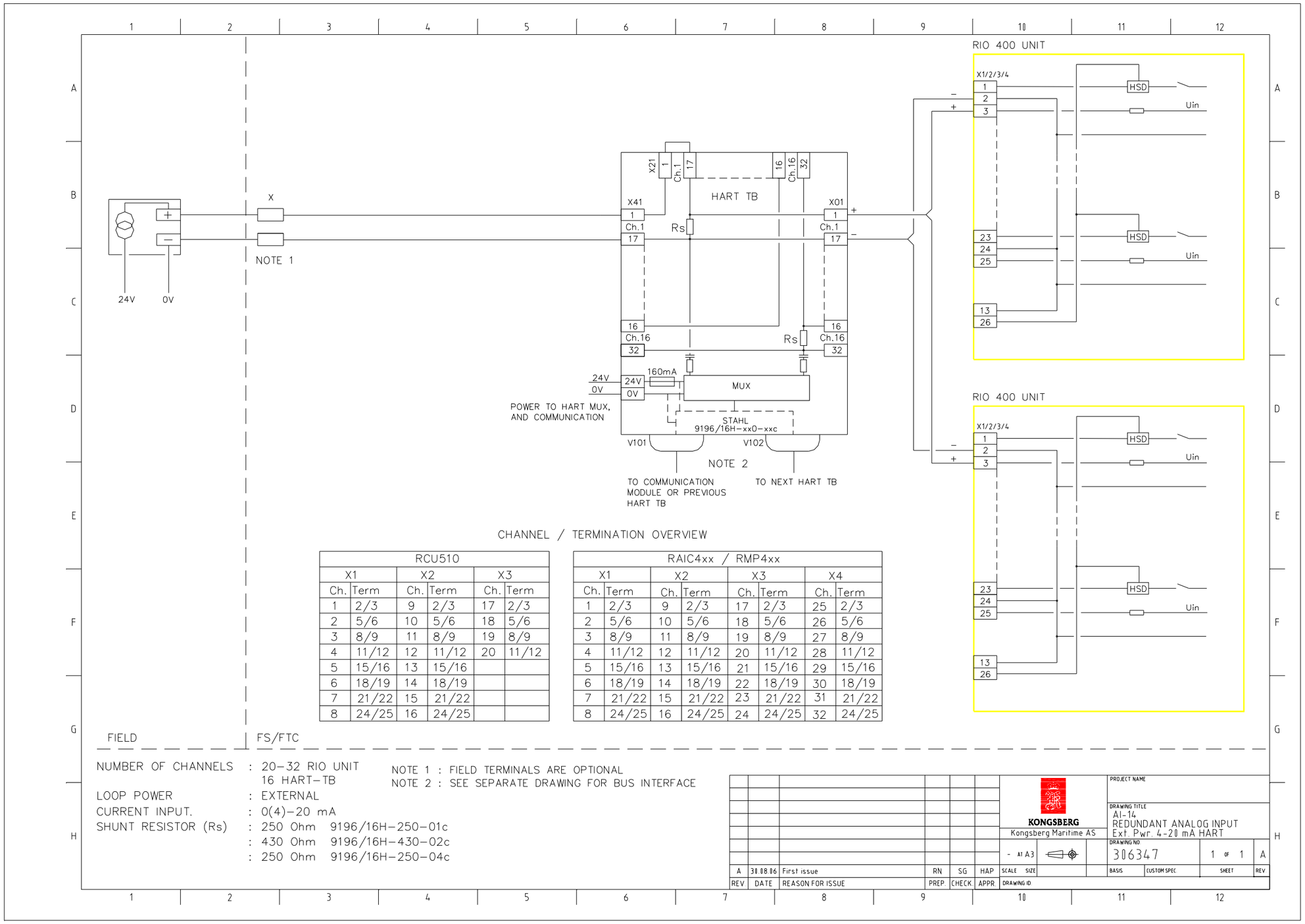
PROJECT NAME

DRAWING TITLE
AI-13
ANALOG INPUT 3 WIRE 4-20mA
WITH HART

DRAWING NO. 306346 | 1 OF 1 | A

SCALE – AT A3 | BASIS | CUSTOM SPEC. | SHEET | REV.

DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3
2	5/6	10	5/6	18	5/6
3	8/9	11	8/9	19	8/9
4	11/12	12	11/12	20	11/12
5	15/16	13	15/16		
6	18/19	14	18/19		
7	21/22	15	21/22		
8	24/25	16	24/25		

RAIC4xx / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

FIELD | FS/FTC

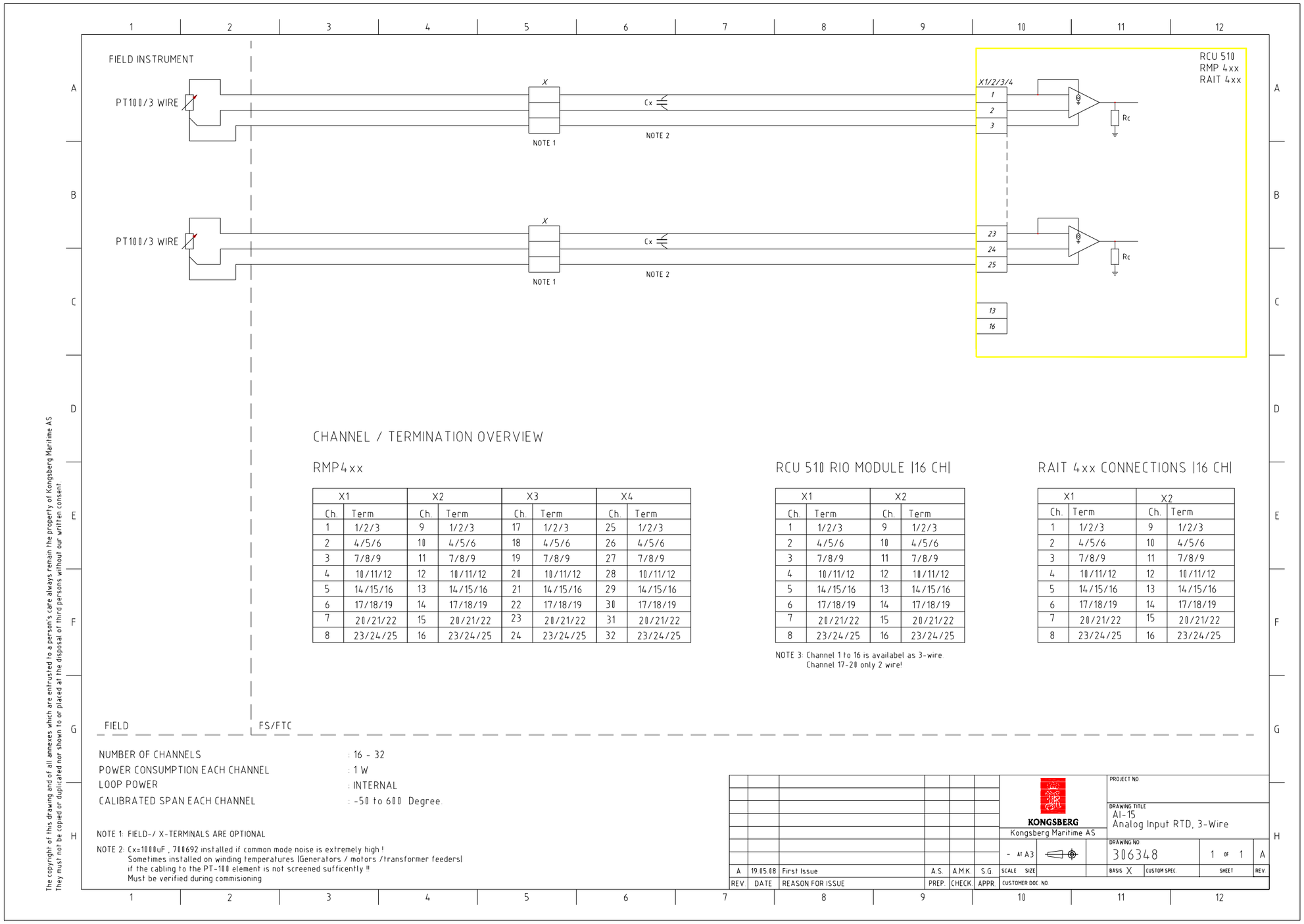
NUMBER OF CHANNELS : 20–32 RIO UNIT
16 HART–TB
LOOP POWER : EXTERNAL
CURRENT INPUT. : 0(4)–20 mA
SHUNT RESISTOR (Rs) : 250 Ohm 9196/16H–250–01c
: 430 Ohm 9196/16H–430–02c
: 250 Ohm 9196/16H–250–04c

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME:
DRAWING TITLE: AI-14 REDUNDANT ANALOG INPUT Ext. Pwr. 4-20 mA HART
DRAWING NO: 306347 | SHEET: 1 OF 1 | REV: A
SCALE: - AT A3 | BASIS | CUSTOM SPEC.
DRAWING ID:



CHANNEL / TERMINATION OVERVIEW

RMP4xx

X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3	25	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6	26	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9	27	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12	28	10/11/12
5	14/15/16	13	14/15/16	21	14/15/16	29	14/15/16
6	17/18/19	14	17/18/19	22	17/18/19	30	17/18/19
7	20/21/22	15	20/21/22	23	20/21/22	31	20/21/22
8	23/24/25	16	23/24/25	24	23/24/25	32	23/24/25

RCU 510 RIO MODULE [16 CH]

X1		X2	
Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3
2	4/5/6	10	4/5/6
3	7/8/9	11	7/8/9
4	10/11/12	12	10/11/12
5	14/15/16	13	14/15/16
6	17/18/19	14	17/18/19
7	20/21/22	15	20/21/22
8	23/24/25	16	23/24/25

NOTE 3: Channel 1 to 16 is availabel as 3-wire.
Channel 17-20 only 2 wire!

RAIT 4xx CONNECTIONS [16 CH]

X1		X2	
Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3
2	4/5/6	10	4/5/6
3	7/8/9	11	7/8/9
4	10/11/12	12	10/11/12
5	14/15/16	13	14/15/16
6	17/18/19	14	17/18/19
7	20/21/22	15	20/21/22
8	23/24/25	16	23/24/25

NUMBER OF CHANNELS : 16 - 32
POWER CONSUMPTION EACH CHANNEL : 1 W
LOOP POWER : INTERNAL
CALIBRATED SPAN EACH CHANNEL : -50 to 600 Degree.

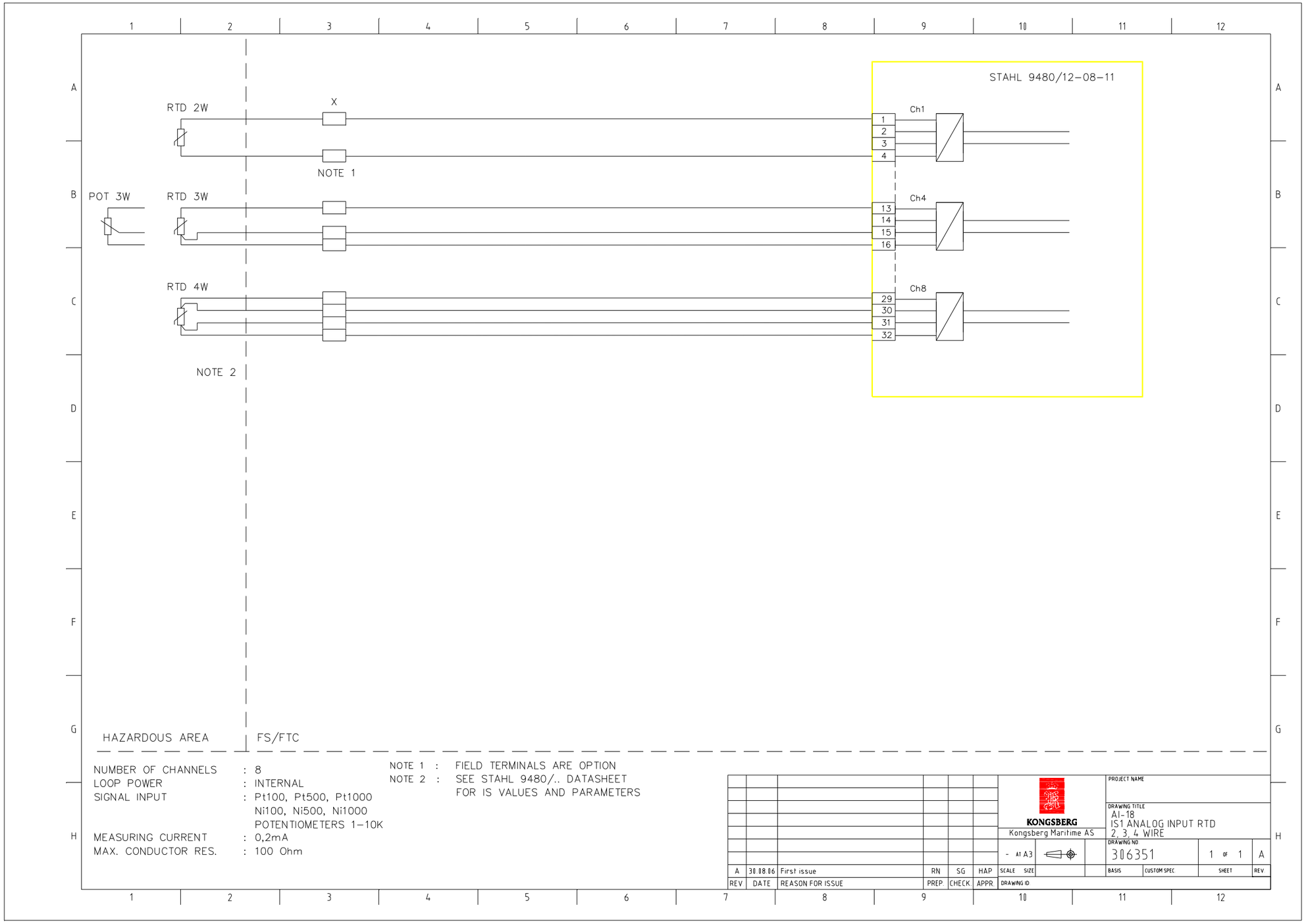
NOTE 1: FIELD-/ X-TERMINALS ARE OPTIONAL

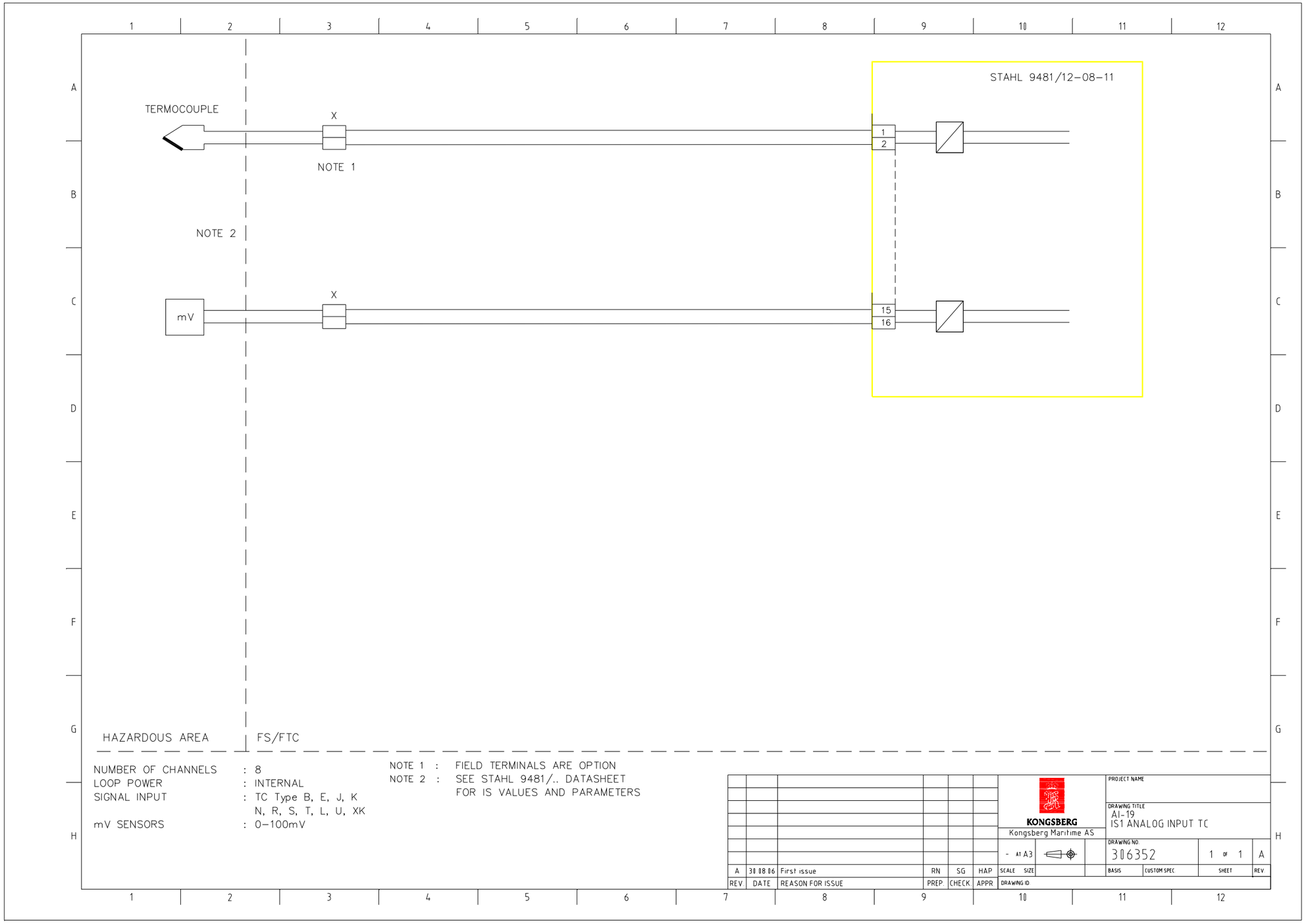
NOTE 2: Cx=1000uF , 700692 installed if common mode noise is extremely high !
Sometimes installed on winding temperatures [Generators / motors /transformer feeders]
if the cabling to the PT-100 element is not screened sufficently !!
Must be verified during commisioning

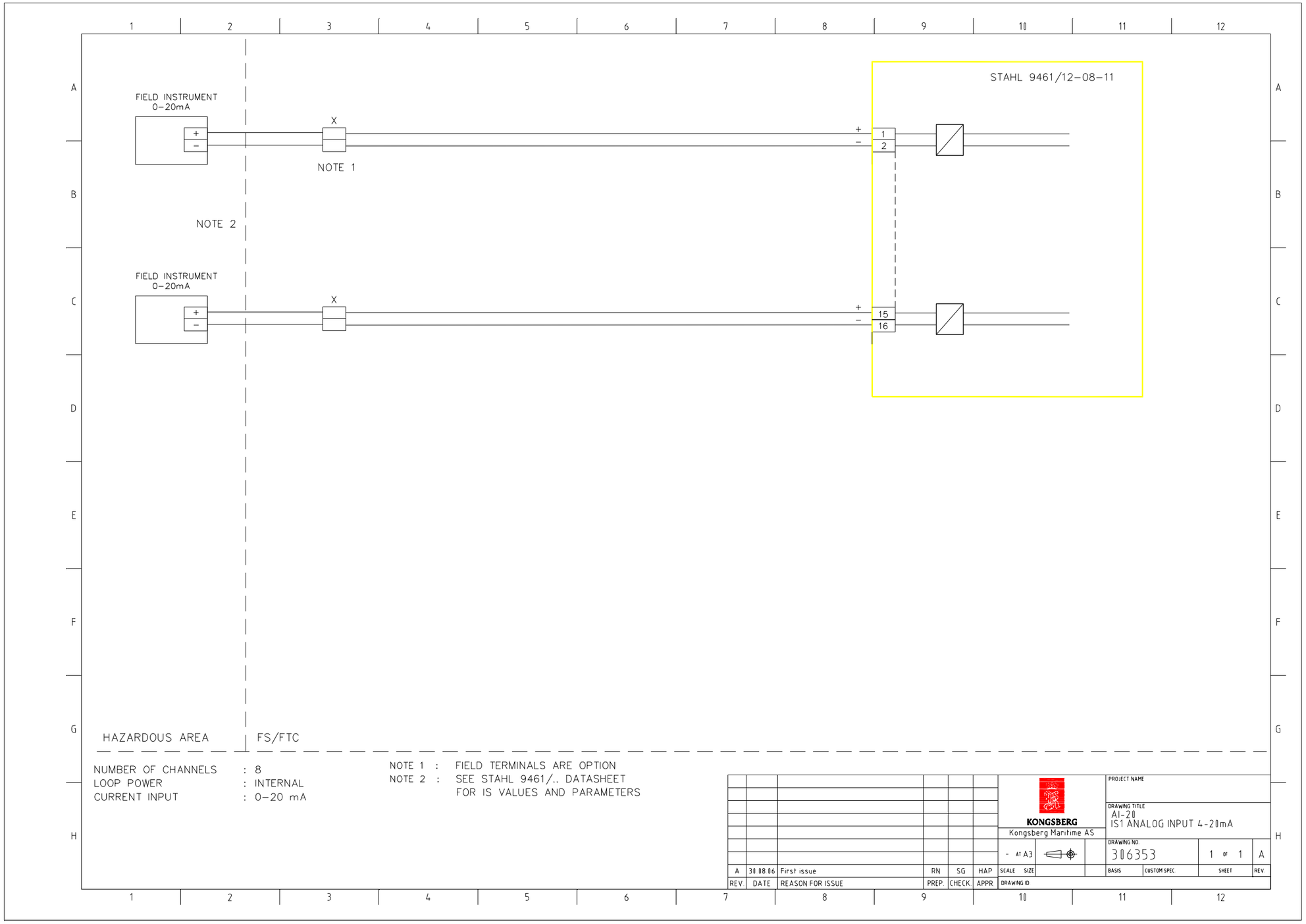
REV	DATE	REASON FOR ISSUE	PREP	CHECK	APPR
A	19.05.08	First Issue	A.S.	A.M.K.	S.G.

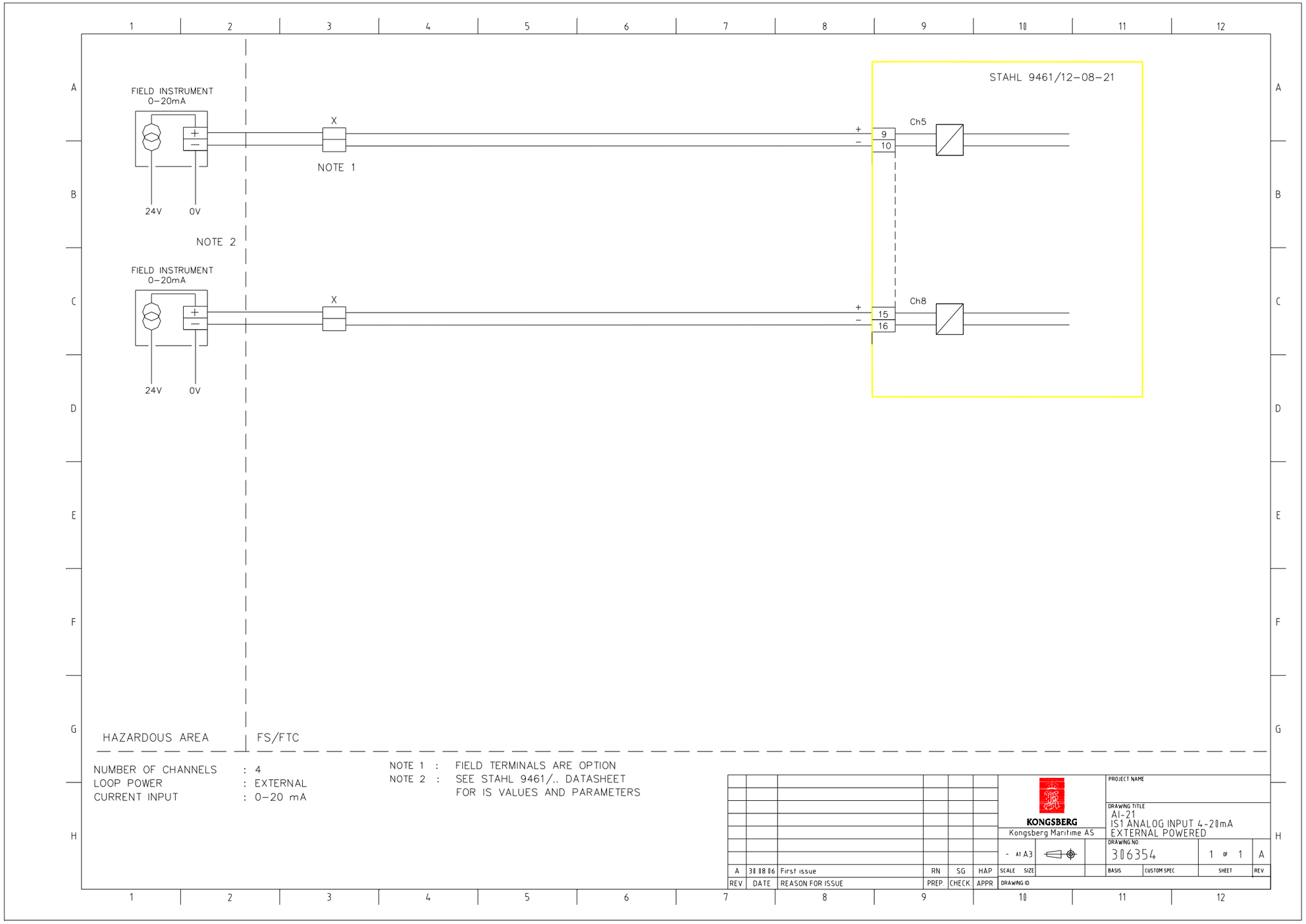
KONGSBERG
Kongsberg Maritime AS

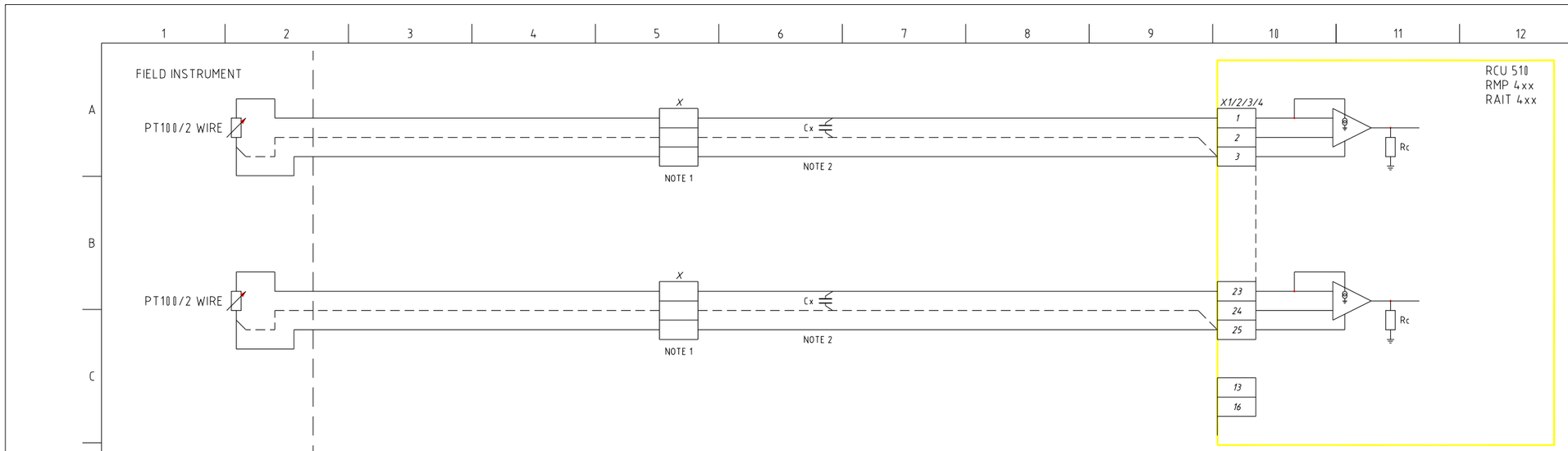
PROJECT NO.
DRAWING TITLE: AI-15 Analog Input RTD, 3-Wire
DRAWING NO.: 306348 | 1 OF 1 | A
SCALE - AT A3 | SIZE | BASIS X | CUSTOM SPEC. | SHEET | REV.
CUSTOMER DOC. NO.


STAHL 9480/12-08-11
RTD 2W
X
NOTE 1
POT 3W
RTD 3W
RTD 4W
NOTE 2
Ch1
Ch4
Ch8
1
2
3
4
13
14
15
16
29
30
31
32
HAZARDOUS AREA
FS/FTC
NUMBER OF CHANNELS : 8
LOOP POWER : INTERNAL
SIGNAL INPUT : Pt100, Pt500, Pt1000
Ni100, Ni500, Ni1000
POTENTIOMETERS 1-10K
MEASURING CURRENT : 0,2mA
MAX. CONDUCTOR RES. : 100 Ohm
NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : SEE STAHL 9480/.. DATASHEET
FOR IS VALUES AND PARAMETERS
A 30.08.06 First issue RN SG HAP
REV DATE REASON FOR ISSUE PREP. CHECK. APPR.
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
AI-18
IS1 ANALOG INPUT RTD
2 3 4 WIRE
DRAWING NO
306351
1 OF 1
A
- A1 A3
SCALE SIZE
BASIS
CUSTOM SPEC
SHEET
REV.
DRAWING ID


STAHL 9481/12-08-11
TERMOCOUPLE
X
NOTE 1
NOTE 2
mV
X
1
2
15
16
HAZARDOUS AREA
FS/FTC
NUMBER OF CHANNELS : 8
LOOP POWER : INTERNAL
SIGNAL INPUT : TC Type B, E, J, K
N, R, S, T, L, U, XK
mV SENSORS : 0-100mV
NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : SEE STAHL 9481/.. DATASHEET
FOR IS VALUES AND PARAMETERS
A 31 08 06 First issue RN SG HAP
REV. DATE REASON FOR ISSUE PREP. CHECK. APPR.
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
AI-19
IS1 ANALOG INPUT TC
DRAWING NO.
306352
- A1 A3
SCALE SIZE
BASIS
CUSTOM SPEC
1 OF 1
SHEET
A
REV.
DRAWING ID


STAHL 9461/12-08-11
FIELD INSTRUMENT
0-20mA
+
–
X
NOTE 1
+
–
1
2
NOTE 2
FIELD INSTRUMENT
0-20mA
+
–
X
+
–
15
16
HAZARDOUS AREA
FS/FTC
NUMBER OF CHANNELS : 8
LOOP POWER : INTERNAL
CURRENT INPUT : 0-20 mA
NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : SEE STAHL 9461/.. DATASHEET
FOR IS VALUES AND PARAMETERS
A 31 08 06 First issue RN SG HAP
REV. DATE REASON FOR ISSUE PREP. CHECK. APPR.
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
AI-20
IS1 ANALOG INPUT 4-20mA
DRAWING NO.
306353
1 OF 1
A
- A1 A3
SCALE SIZE
BASIS
CUSTOM SPEC
SHEET
REV
DRAWING ID


STAHL 9461/12-08-21
FIELD INSTRUMENT
0-20mA
24V
0V
X
NOTE 1
NOTE 2
Ch5
Ch8
9
10
15
16
HAZARDOUS AREA
FS/FTC
NUMBER OF CHANNELS : 4
LOOP POWER : EXTERNAL
CURRENT INPUT : 0-20 mA
NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : SEE STAHL 9461/.. DATASHEET
FOR IS VALUES AND PARAMETERS
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
AI-21
IS1 ANALOG INPUT 4-20mA
EXTERNAL POWERED
DRAWING NO
306354
1 OF 1
A
A 30 08 06 First issue RN SG HAP
REV. DATE REASON FOR ISSUE PREP. CHECK. APPR.



CHANNEL / TERMINATION OVERVIEW

RMP 4xx MODULE

X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3	25	1/3
2	4/6	10	4/6	18	4/6	26	4/6
3	7/9	11	7/9	19	7/9	27	7/9
4	10/12	12	10/12	20	10/12	28	10/12
5	14/16	13	14/16	21	14/16	29	14/16
6	17/19	14	17/19	22	17/19	30	17/19
7	20/22	15	20/22	23	20/22	31	20/22
8	23/25	16	23/25	24	23/25	32	23/25

RCU 510 RIO MODULE (20CH)

X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3
2	4/6	10	4/6	18	4/6
3	7/9	11	7/9	19	7/9
4	10/12	12	10/12	20	10/12
5	14/16	13	14/16		
6	17/19	14	17/19		
7	20/22	15	20/22		
8	23/25	16	23/25		

NOTE 3: Channel 1 to 16 is also availabel as 3-wire
Channel 17-20 only 2 wire!

RAIT 4xx CONNECTIONS (16 CH)

X1		X2	
Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3
2	4/5/6	10	4/5/6
3	7/8/9	11	7/8/9
4	10/11/12	12	10/11/12
5	14/15/16	13	14/15/16
6	17/18/19	14	17/18/19
7	20/21/22	15	20/21/22
8	23/24/25	16	23/24/25

FIELD | FS/FTC

NUMBER OF CHANNELS : 16 - 32
POWER CONSUMPTION EACH CHANNEL : 1 W
LOOP POWER : INTERNAL
CALIBRATED SPAN EACH CHANNEL : -50 to 600 Degree.

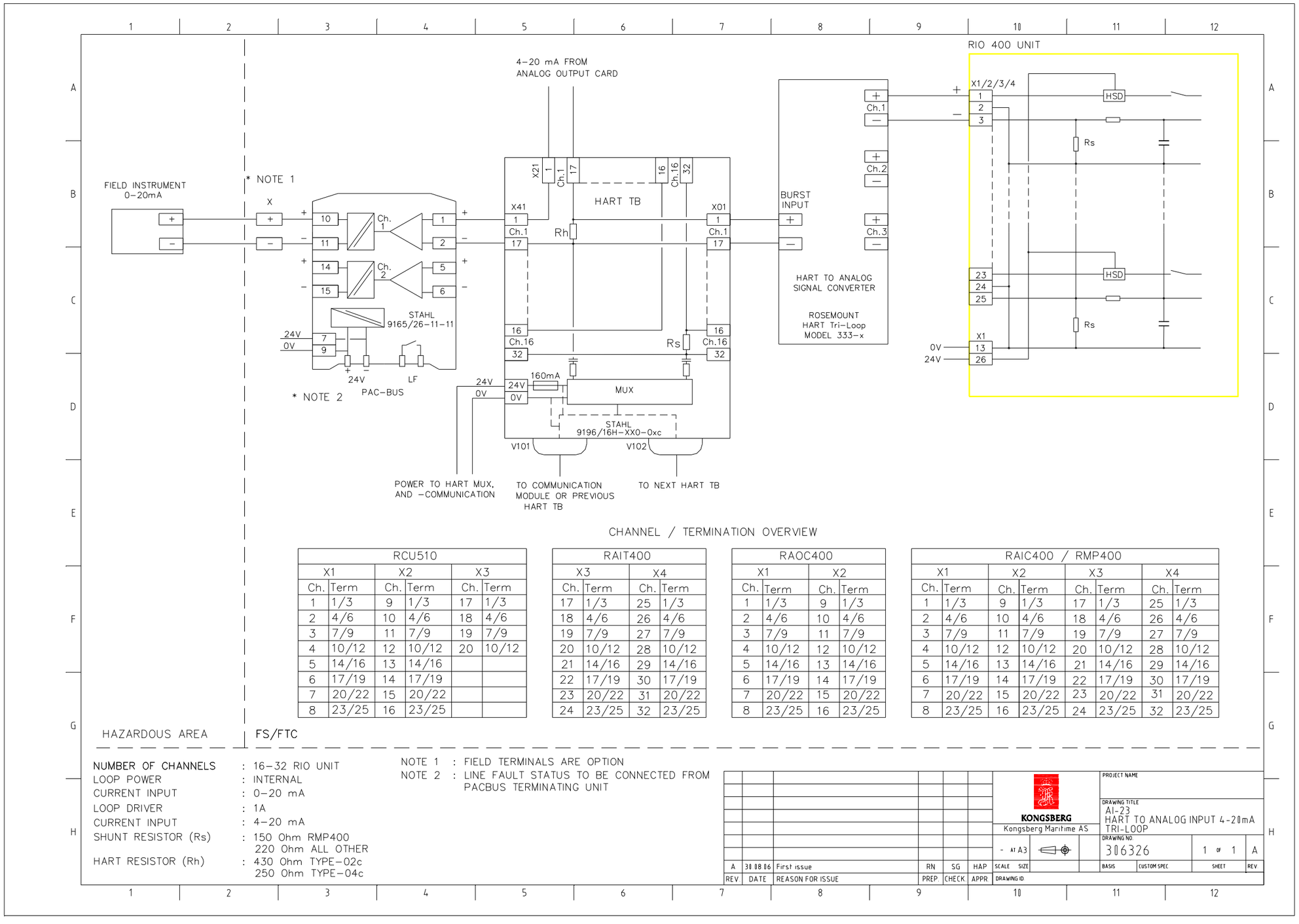
NOTE 1: FIELD-/ X-TERMINALS ARE OPTIONAL

NOTE 2: Cx=1000uF , 700692 installed if common mode noise is extremely high !
Sometimes installed on winding temperatures (Generators / motors /transformer feeders)
if the cabling to the PT-100 element is not screened sufficently !!
Must be verified during commisioning

REV	DATE	REASON FOR ISSUE	PREP	CHECK	APPR
A	19.05.08	First Issue	A.S.	A.M.K.	S.G.

KONGSBERG
Kongsberg Maritime AS

PROJECT NO.
DRAWING TITLE: AI-22 Analog Input RTD, 2-Wire
DRAWING NO.: 306355 | 1 OF 1 | A
SCALE - AT A3 SIZE | BASIS X | CUSTOM SPEC. | SHEET | REV.
CUSTOMER DOC. NO.



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3
2	4/6	10	4/6	18	4/6
3	7/9	11	7/9	19	7/9
4	10/12	12	10/12	20	10/12
5	14/16	13	14/16		
6	17/19	14	17/19		
7	20/22	15	20/22		
8	23/25	16	23/25		

RAIT400			
X3		X4	
Ch.	Term	Ch.	Term
17	1/3	25	1/3
18	4/6	26	4/6
19	7/9	27	7/9
20	10/12	28	10/12
21	14/16	29	14/16
22	17/19	30	17/19
23	20/22	31	20/22
24	23/25	32	23/25

RAOC400			
X1		X2	
Ch.	Term	Ch.	Term
1	1/3	9	1/3
2	4/6	10	4/6
3	7/9	11	7/9
4	10/12	12	10/12
5	14/16	13	14/16
6	17/19	14	17/19
7	20/22	15	20/22
8	23/25	16	23/25

RAIC400 / RMP400							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3	25	1/3
2	4/6	10	4/6	18	4/6	26	4/6
3	7/9	11	7/9	19	7/9	27	7/9
4	10/12	12	10/12	20	10/12	28	10/12
5	14/16	13	14/16	21	14/16	29	14/16
6	17/19	14	17/19	22	17/19	30	17/19
7	20/22	15	20/22	23	20/22	31	20/22
8	23/25	16	23/25	24	23/25	32	23/25

HAZARDOUS AREA | FS/FTC

NUMBER OF CHANNELS : 16–32 RIO UNIT
LOOP POWER : INTERNAL
CURRENT INPUT : 0–20 mA
LOOP DRIVER : 1A
CURRENT INPUT : 4–20 mA
SHUNT RESISTOR (Rs) : 150 Ohm RMP400
220 Ohm ALL OTHER
HART RESISTOR (Rh) : 430 Ohm TYPE–02c
250 Ohm TYPE–04c

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

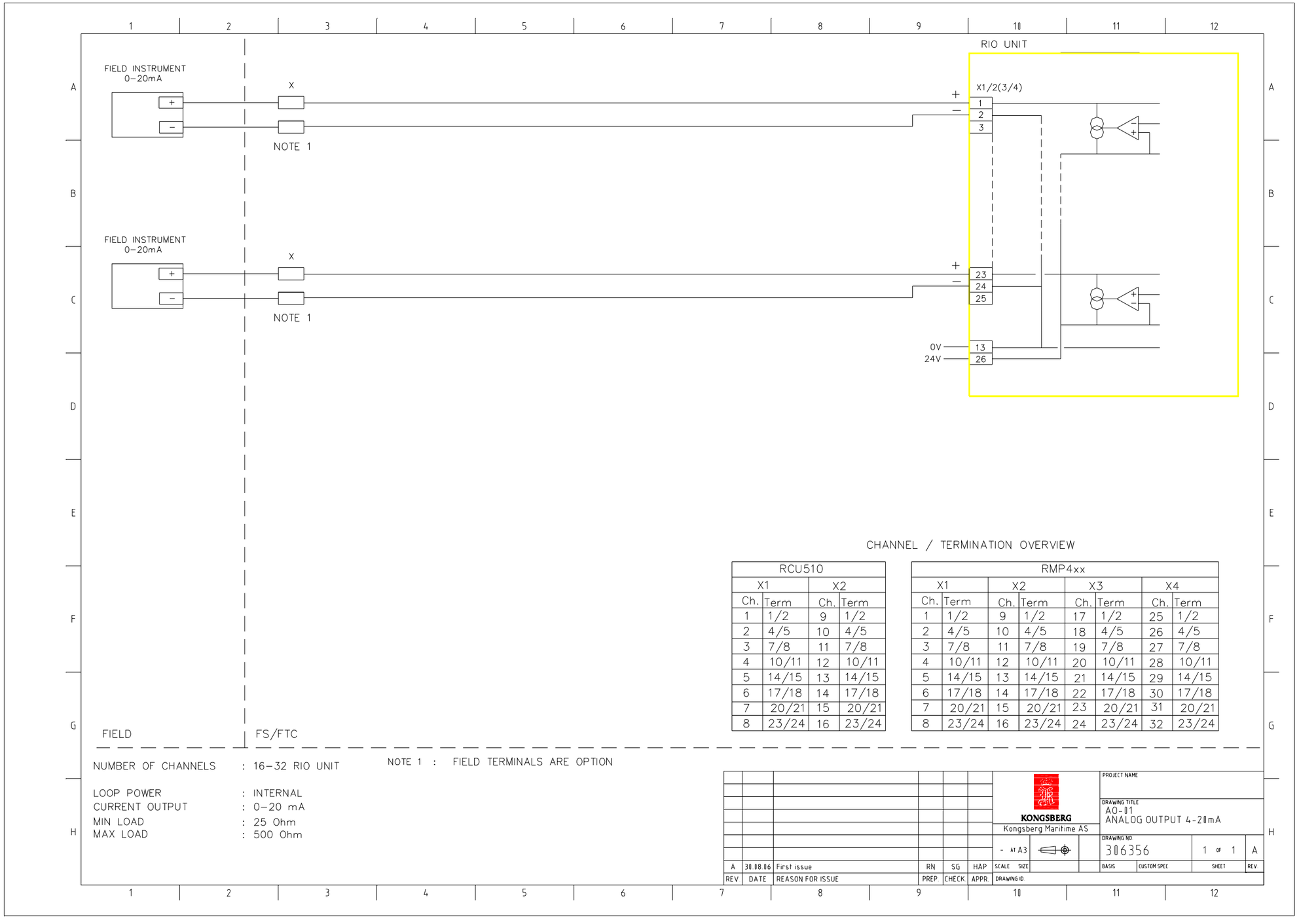
PROJECT NAME

DRAWING TITLE
AI-23
HART TO ANALOG INPUT 4-20mA
TRI-LOOP

DRAWING NO 306326 | 1 OF 1 | A

SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC | SHEET | REV

DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2	9	1/2
2	4/5	10	4/5
3	7/8	11	7/8
4	10/11	12	10/11
5	14/15	13	14/15
6	17/18	14	17/18
7	20/21	15	20/21
8	23/24	16	23/24

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

NUMBER OF CHANNELS : 16–32 RIO UNIT

LOOP POWER : INTERNAL
CURRENT OUTPUT : 0–20 mA
MIN LOAD : 25 Ohm
MAX LOAD : 500 Ohm

NOTE 1 : FIELD TERMINALS ARE OPTION

REV	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

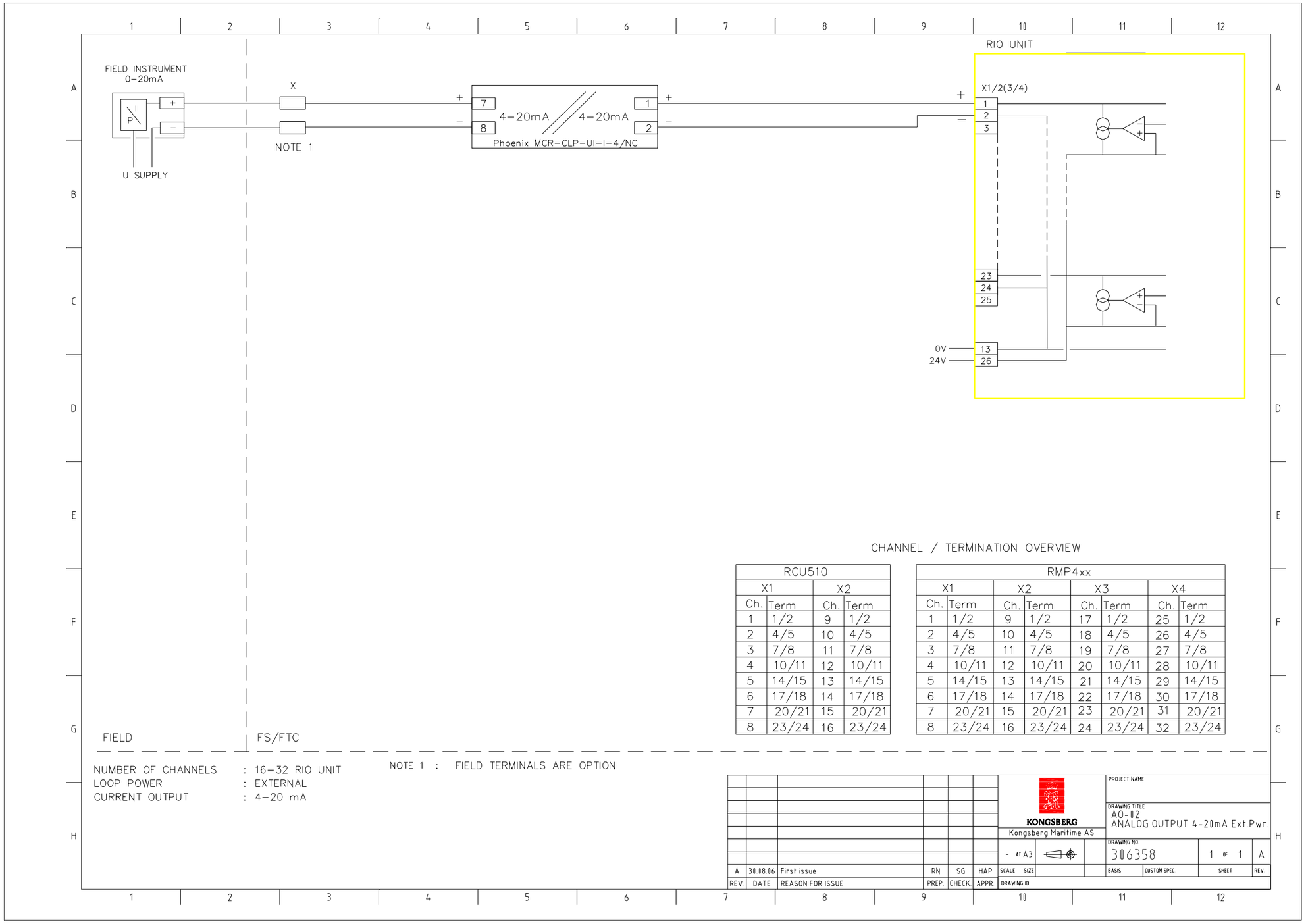
PROJECT NAME

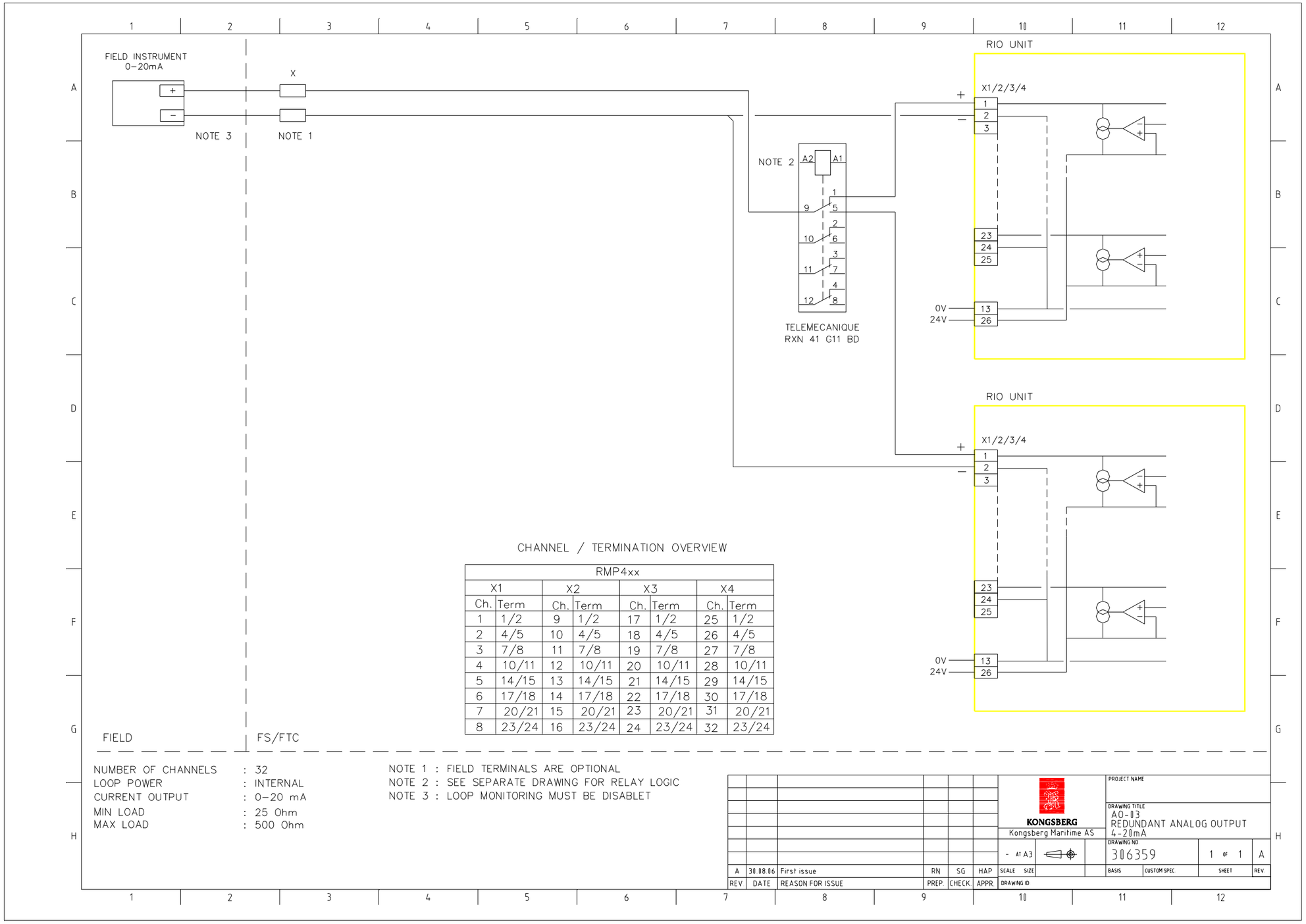
DRAWING TITLE
AO-01
ANALOG OUTPUT 4-20mA

DRAWING NO
306356

SCALE - SIZE A1 A3 | BASIS | CUSTOM SPEC | SHEET 1 OF 1 | REV. A

DRAWING ID


FIELD INSTRUMENT
0–20mA
I/P
+
–
U SUPPLY
X
NOTE 1
7
8
4–20mA
4–20mA
1
2
Phoenix MCR–CLP–UI–I–4/NC
RIO UNIT
X1/2(3/4)
1
2
3
23
24
25
0V
24V
13
26
FIELD
FS/FTC
NUMBER OF CHANNELS : 16–32 RIO UNIT
LOOP POWER : EXTERNAL
CURRENT OUTPUT : 4–20 mA
NOTE 1 : FIELD TERMINALS ARE OPTION
CHANNEL / TERMINATION OVERVIEW
RCU510
X1 Ch. Term: 1 1/2; 2 4/5; 3 7/8; 4 10/11; 5 14/15; 6 17/18; 7 20/21; 8 23/24
X2 Ch. Term: 9 1/2; 10 4/5; 11 7/8; 12 10/11; 13 14/15; 14 17/18; 15 20/21; 16 23/24
RMP4xx
X1 Ch. Term: 1 1/2; 2 4/5; 3 7/8; 4 10/11; 5 14/15; 6 17/18; 7 20/21; 8 23/24
X2 Ch. Term: 9 1/2; 10 4/5; 11 7/8; 12 10/11; 13 14/15; 14 17/18; 15 20/21; 16 23/24
X3 Ch. Term: 17 1/2; 18 4/5; 19 7/8; 20 10/11; 21 14/15; 22 17/18; 23 20/21; 24 23/24
X4 Ch. Term: 25 1/2; 26 4/5; 27 7/8; 28 10/11; 29 14/15; 30 17/18; 31 20/21; 32 23/24
REV A 30.08.06 First issue RN SG HAP
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
AO-02
ANALOG OUTPUT 4-20mA Ext Pwr
DRAWING NO
306358
SCALE - AT A3
1 OF 1
A



CHANNEL / TERMINATION OVERVIEW

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

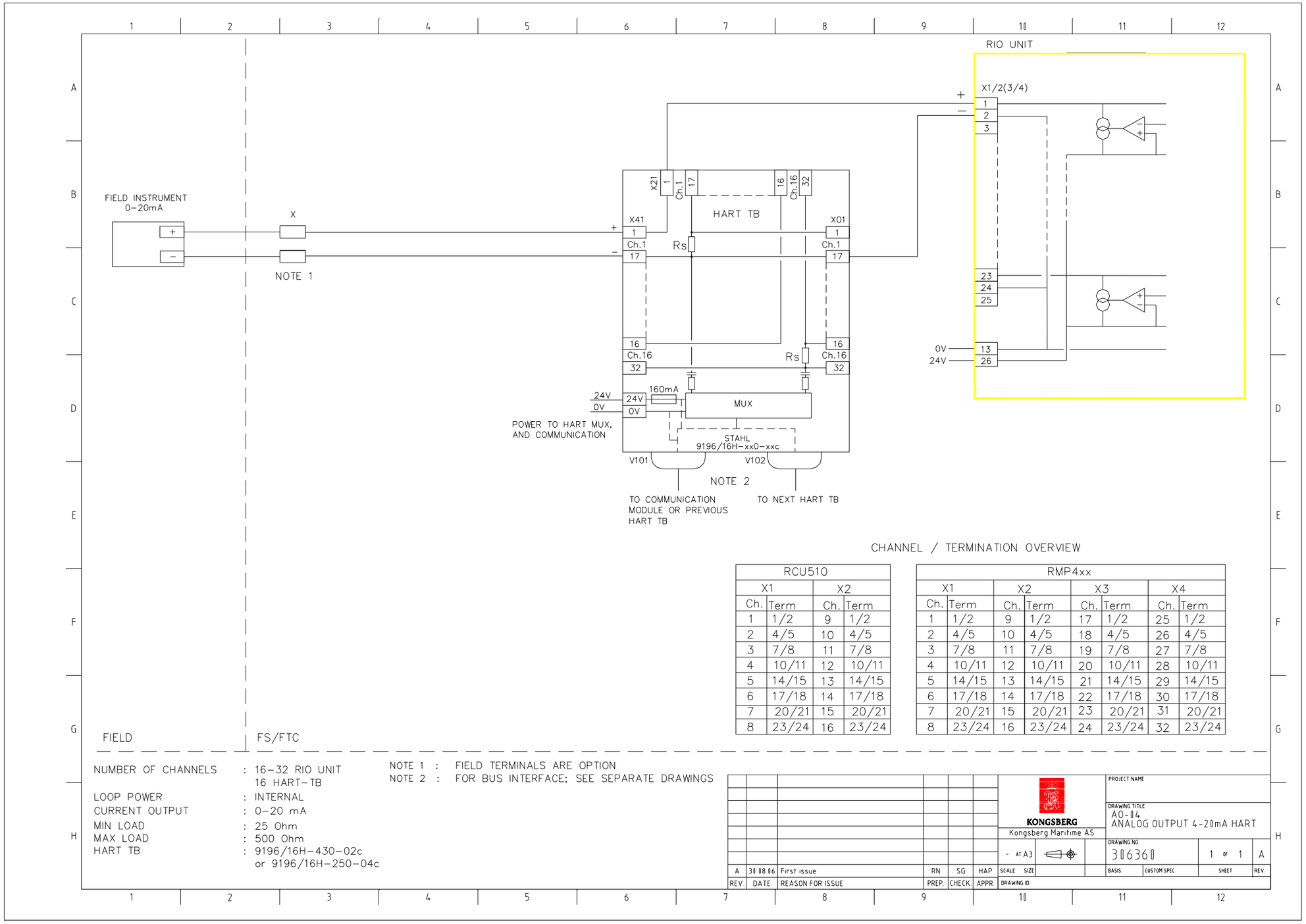
NUMBER OF CHANNELS : 32
LOOP POWER : INTERNAL
CURRENT OUTPUT : 0–20 mA
MIN LOAD : 25 Ohm
MAX LOAD : 500 Ohm

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR RELAY LOGIC
NOTE 3 : LOOP MONITORING MUST BE DISABLET

REV	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: AO-03 REDUNDANT ANALOG OUTPUT 4-20mA
DRAWING NO: 306359
SCALE: - AT A3 SIZE: A BASIS: CUSTOM SPEC SHEET: 1 OF 1 REV: A
DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2	9	1/2
2	4/5	10	4/5
3	7/8	11	7/8
4	10/11	12	10/11
5	14/15	13	14/15
6	17/18	14	17/18
7	20/21	15	20/21
8	23/24	16	23/24

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

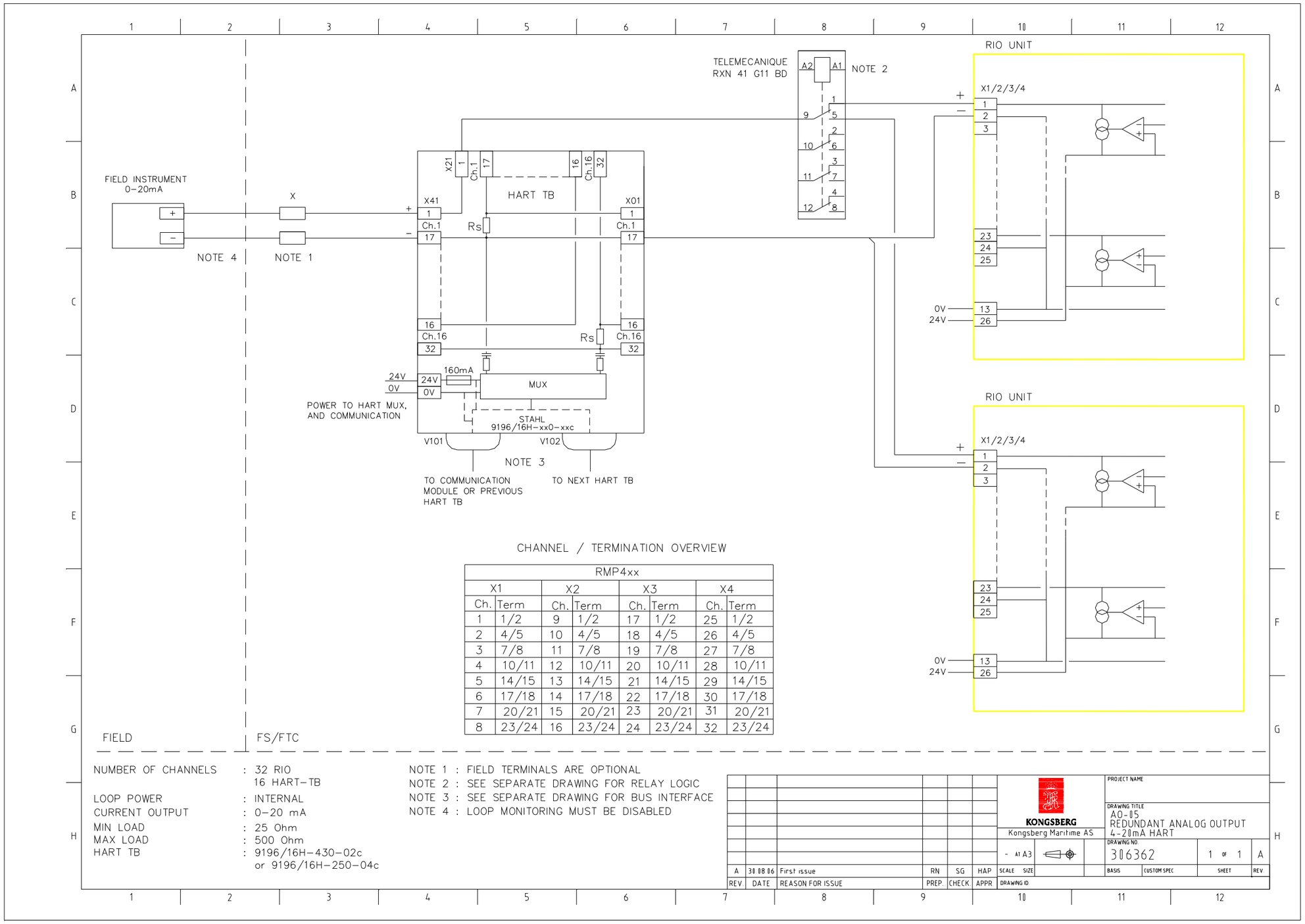
NUMBER OF CHANNELS : 16–32 RIO UNIT
16 HART–TB
LOOP POWER : INTERNAL
CURRENT OUTPUT : 0–20 mA
MIN LOAD : 25 Ohm
MAX LOAD : 500 Ohm
HART TB : 9196/16H–430–02c
or 9196/16H–250–04c

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : FOR BUS INTERFACE; SEE SEPARATE DRAWINGS

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR
A	31.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE
AO-04
ANALOG OUTPUT 4-20mA HART
DRAWING NO. 306360
SCALE - AT A3 SIZE
BASIS CUSTOM SPEC. SHEET 1 OF 1 REV. A
DRAWING ID.



CHANNEL / TERMINATION OVERVIEW

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

NUMBER OF CHANNELS : 32 RIO
16 HART–TB

LOOP POWER : INTERNAL
CURRENT OUTPUT : 0–20 mA
MIN LOAD : 25 Ohm
MAX LOAD : 500 Ohm
HART TB : 9196/16H–430–02c
or 9196/16H–250–04c

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR RELAY LOGIC
NOTE 3 : SEE SEPARATE DRAWING FOR BUS INTERFACE
NOTE 4 : LOOP MONITORING MUST BE DISABLED

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR
A	31.08.06	First issue	RN	SG	HAP

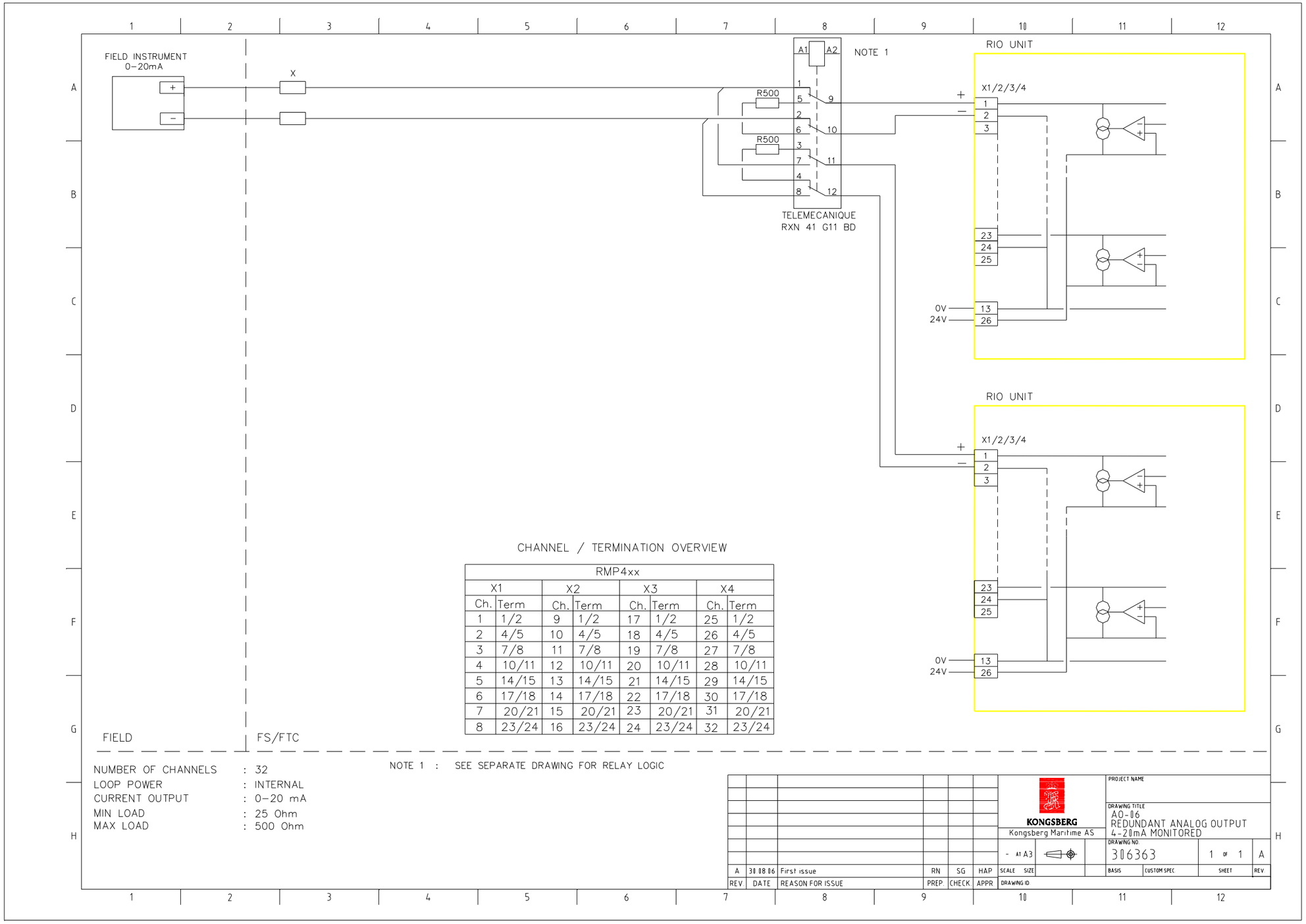
KONGSBERG
Kongsberg Maritime AS

PROJECT NAME

DRAWING TITLE
AO-05
REDUNDANT ANALOG OUTPUT
4-20mA HART

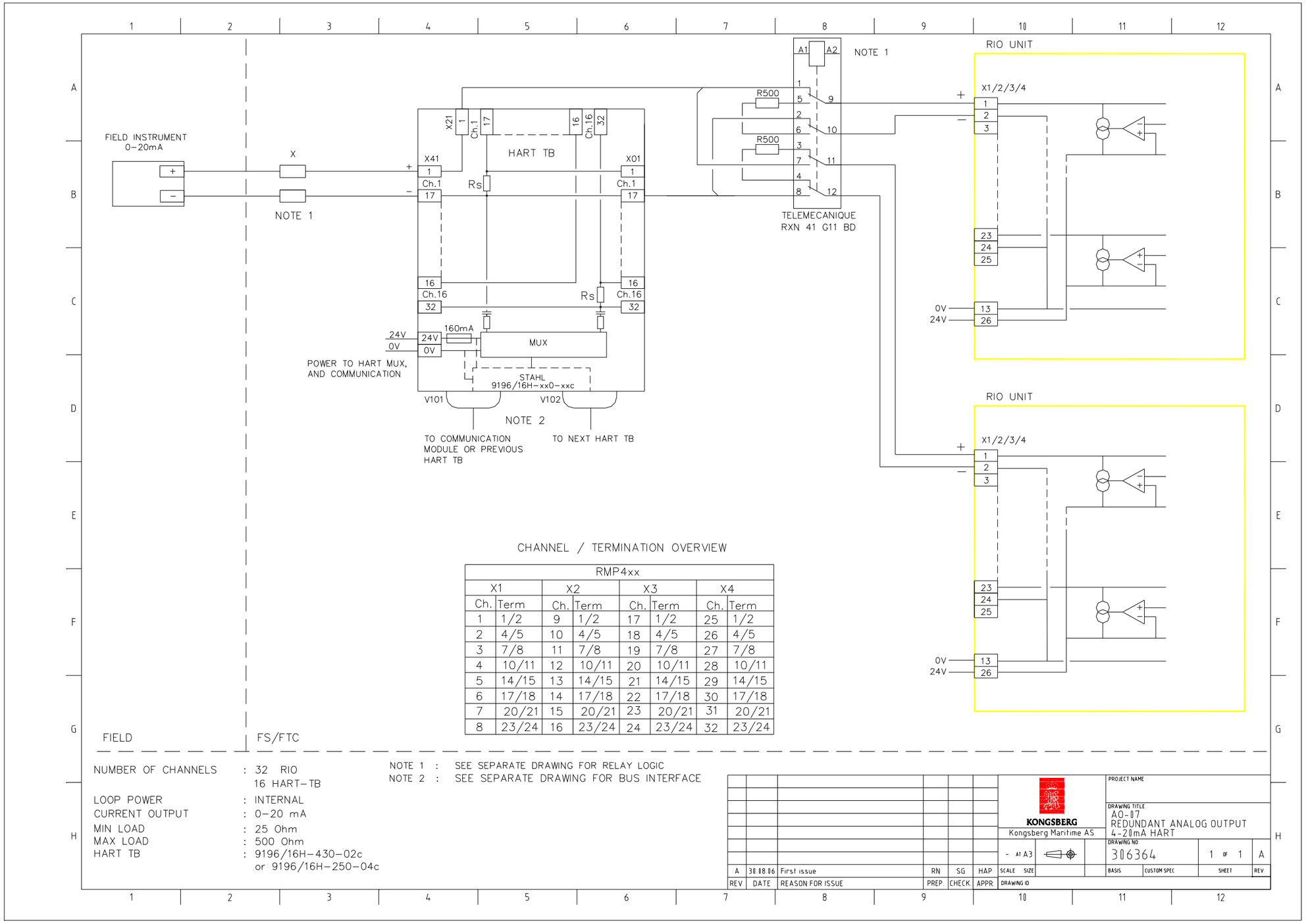
DRAWING NO. 306362 | SHEET 1 OF 1 | REV. A

SCALE - | SIZE A3 | BASIS | CUSTOM SPEC | DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24



CHANNEL / TERMINATION OVERVIEW

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

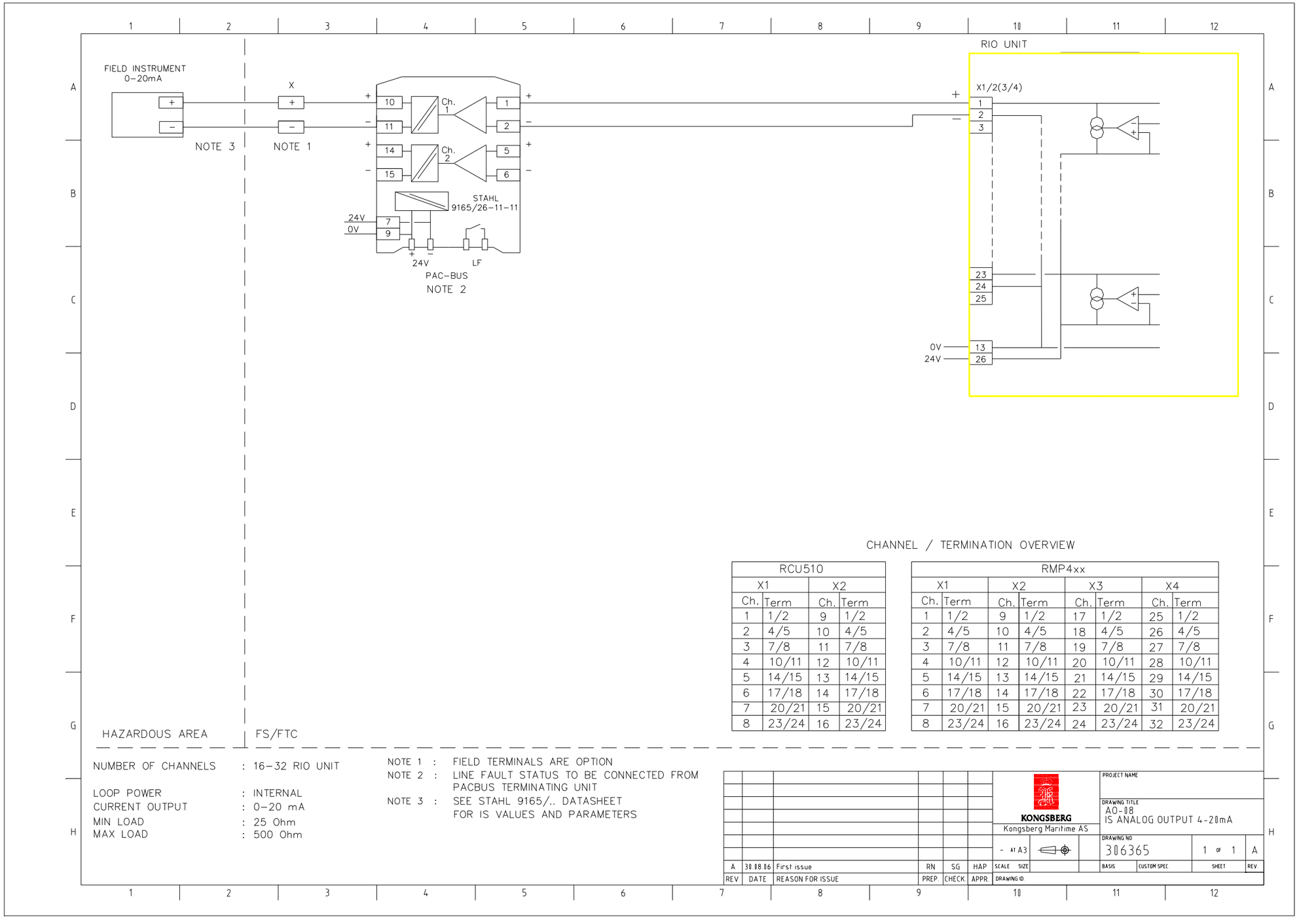
NUMBER OF CHANNELS : 32 RIO
16 HART–TB
LOOP POWER : INTERNAL
CURRENT OUTPUT : 0–20 mA
MIN LOAD : 25 Ohm
MAX LOAD : 500 Ohm
HART TB : 9196/16H–430–02c
or 9196/16H–250–04c

NOTE 1 : SEE SEPARATE DRAWING FOR RELAY LOGIC
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE

REV	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: AO-07 REDUNDANT ANALOG OUTPUT 4-20mA HART
DRAWING NO: 306364
SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC | SHEET 1 OF 1 | REV A
DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2	9	1/2
2	4/5	10	4/5
3	7/8	11	7/8
4	10/11	12	10/11
5	14/15	13	14/15
6	17/18	14	17/18
7	20/21	15	20/21
8	23/24	16	23/24

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

NUMBER OF CHANNELS : 16–32 RIO UNIT

LOOP POWER : INTERNAL
CURRENT OUTPUT : 0–20 mA
MIN LOAD : 25 Ohm
MAX LOAD : 500 Ohm

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 3 : SEE STAHL 9165/.. DATASHEET FOR IS VALUES AND PARAMETERS

REV	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

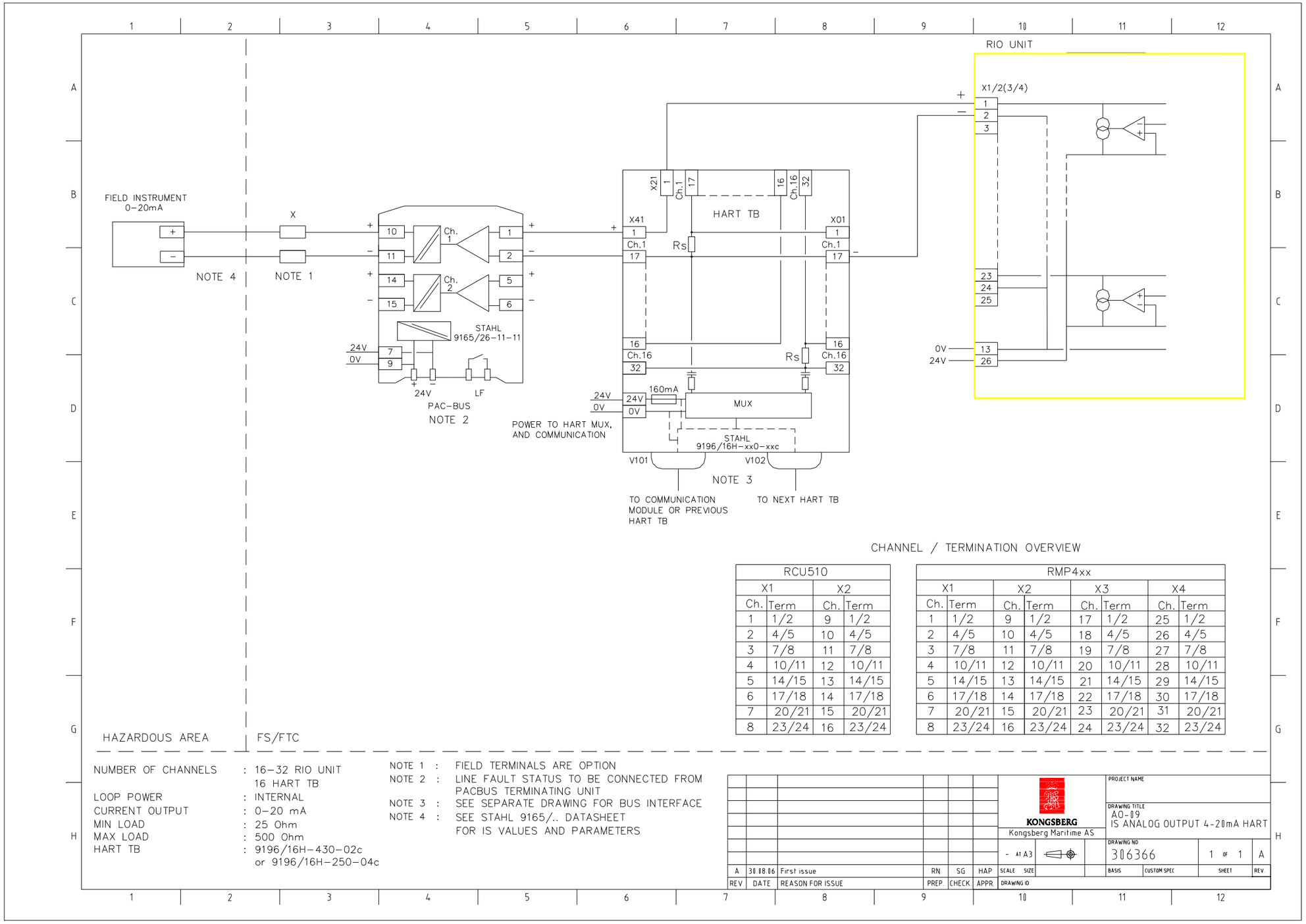
PROJECT NAME

DRAWING TITLE
AO-08
IS ANALOG OUTPUT 4-20mA

DRAWING NO
306365

SCALE - SIZE A1 A3 | BASIS | CUSTOM SPEC | SHEET 1 OF 1 | REV A

DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2	9	1/2
2	4/5	10	4/5
3	7/8	11	7/8
4	10/11	12	10/11
5	14/15	13	14/15
6	17/18	14	17/18
7	20/21	15	20/21
8	23/24	16	23/24

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

NUMBER OF CHANNELS	: 16–32 RIO UNIT 16 HART TB
LOOP POWER	: INTERNAL
CURRENT OUTPUT	: 0–20 mA
MIN LOAD	: 25 Ohm
MAX LOAD	: 500 Ohm
HART TB	: 9196/16H–430–02c or 9196/16H–250–04c

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 3 : SEE SEPARATE DRAWING FOR BUS INTERFACE
NOTE 4 : SEE STAHL 9165/.. DATASHEET FOR IS VALUES AND PARAMETERS

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

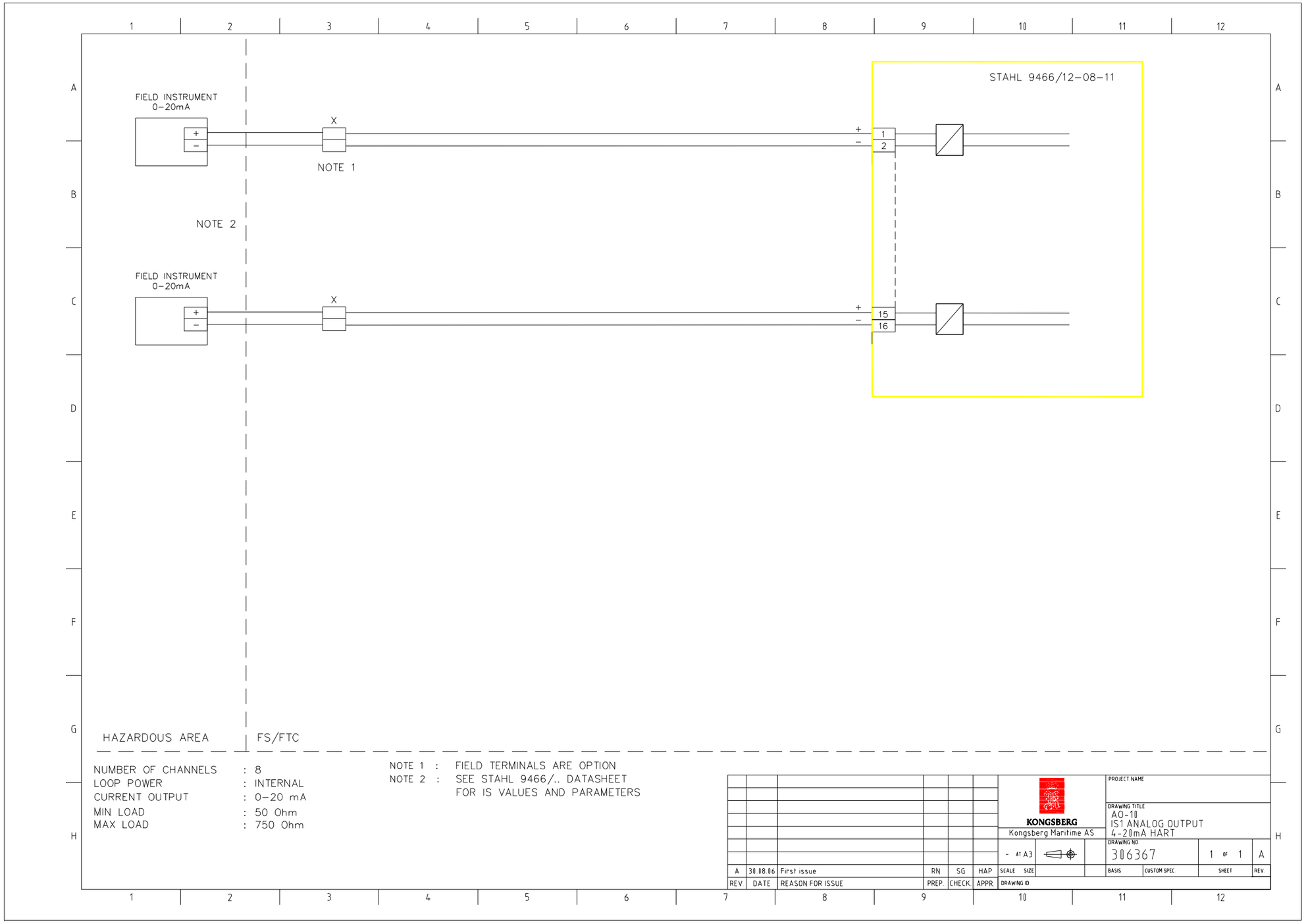
PROJECT NAME

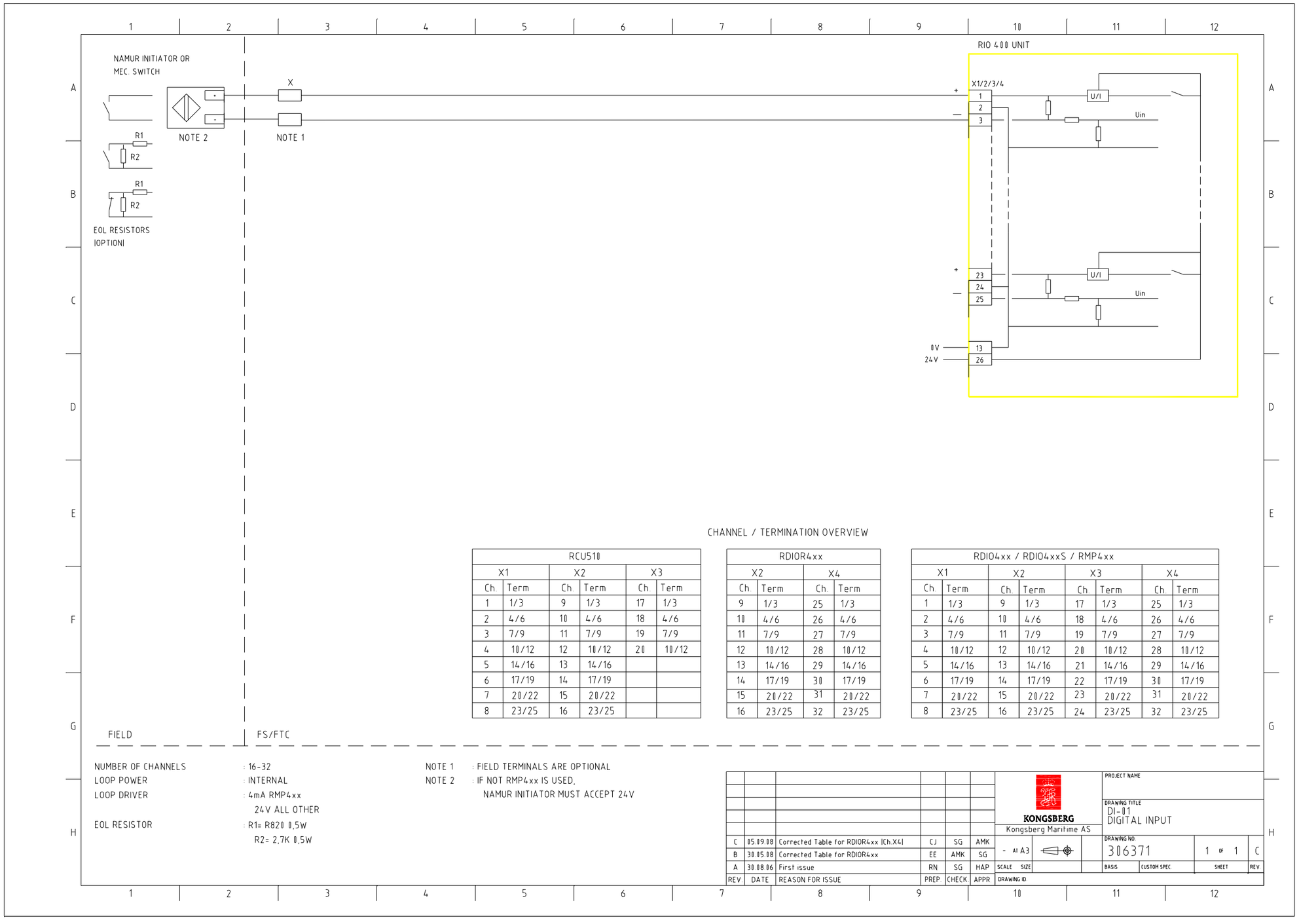
DRAWING TITLE
AO-09
IS ANALOG OUTPUT 4-20mA HART

DRAWING NO. 306366 | 1 OF 1 | A

SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET | REV.

DRAWING ID.


STAHL 9466/12-08-11
FIELD INSTRUMENT
0-20mA
+
-
X
NOTE 1
+
-
1
2
NOTE 2
FIELD INSTRUMENT
0-20mA
+
-
X
+
-
15
16
HAZARDOUS AREA
FS/FTC
NUMBER OF CHANNELS : 8
LOOP POWER : INTERNAL
CURRENT OUTPUT : 0-20 mA
MIN LOAD : 50 Ohm
MAX LOAD : 750 Ohm
NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : SEE STAHL 9466/.. DATASHEET
FOR IS VALUES AND PARAMETERS
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
AO-18
IS1 ANALOG OUTPUT
4-20mA HART
DRAWING NO
306367
1 OF 1
A
- A1 A3
A 30.08.06 First issue RN SG HAP
REV DATE REASON FOR ISSUE PREP. CHECK. APPR.
SCALE SIZE
BASIS
CUSTOM SPEC
SHEET
REV.
DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3
2	4/6	10	4/6	18	4/6
3	7/9	11	7/9	19	7/9
4	10/12	12	10/12	20	10/12
5	14/16	13	14/16		
6	17/19	14	17/19		
7	20/22	15	20/22		
8	23/25	16	23/25		

RDIOR4xx			
X2		X4	
Ch.	Term	Ch.	Term
9	1/3	25	1/3
10	4/6	26	4/6
11	7/9	27	7/9
12	10/12	28	10/12
13	14/16	29	14/16
14	17/19	30	17/19
15	20/22	31	20/22
16	23/25	32	23/25

RDIO4xx / RDIO4xxS / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3	25	1/3
2	4/6	10	4/6	18	4/6	26	4/6
3	7/9	11	7/9	19	7/9	27	7/9
4	10/12	12	10/12	20	10/12	28	10/12
5	14/16	13	14/16	21	14/16	29	14/16
6	17/19	14	17/19	22	17/19	30	17/19
7	20/22	15	20/22	23	20/22	31	20/22
8	23/25	16	23/25	24	23/25	32	23/25

NUMBER OF CHANNELS : 16-32
LOOP POWER : INTERNAL
LOOP DRIVER : 4mA RMP4xx
24V ALL OTHER
EOL RESISTOR : R1= R820 0,5W
R2= 2,7K 0,5W

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : IF NOT RMP4xx IS USED,
NAMUR INITIATOR MUST ACCEPT 24V

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR
C	05.09.08	Corrected Table for RDIOR4xx (Ch.X4)	CJ	SG	AMK
B	30.05.08	Corrected Table for RDIOR4xx	EE	AMK	SG
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

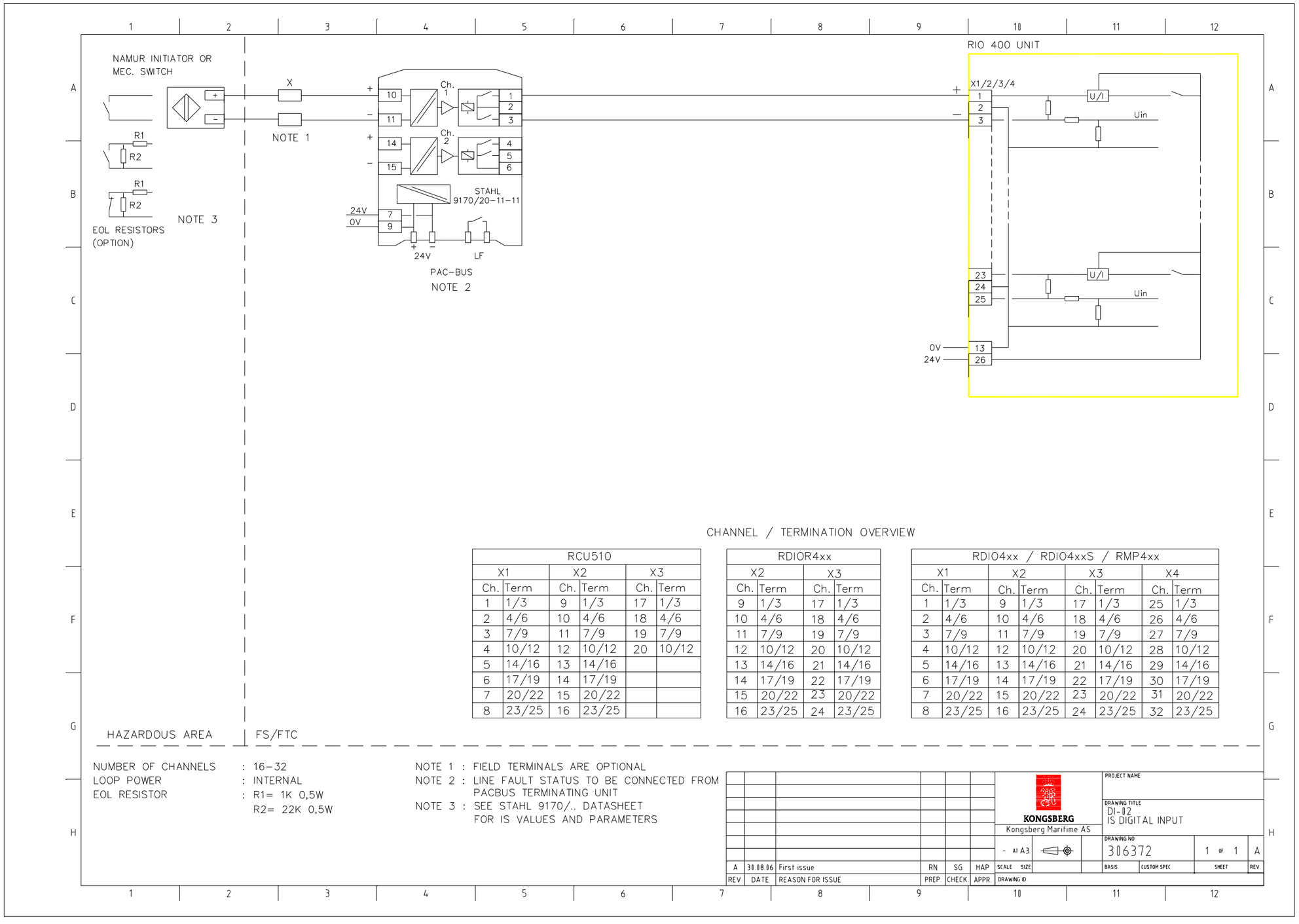
PROJECT NAME

DRAWING TITLE
DI-01
DIGITAL INPUT

DRAWING NO. 306371 | 1 OF 1 | C

SCALE - AT A3 | BASIS | CUSTOM SPEC. | SHEET | REV.

DRAWING ID

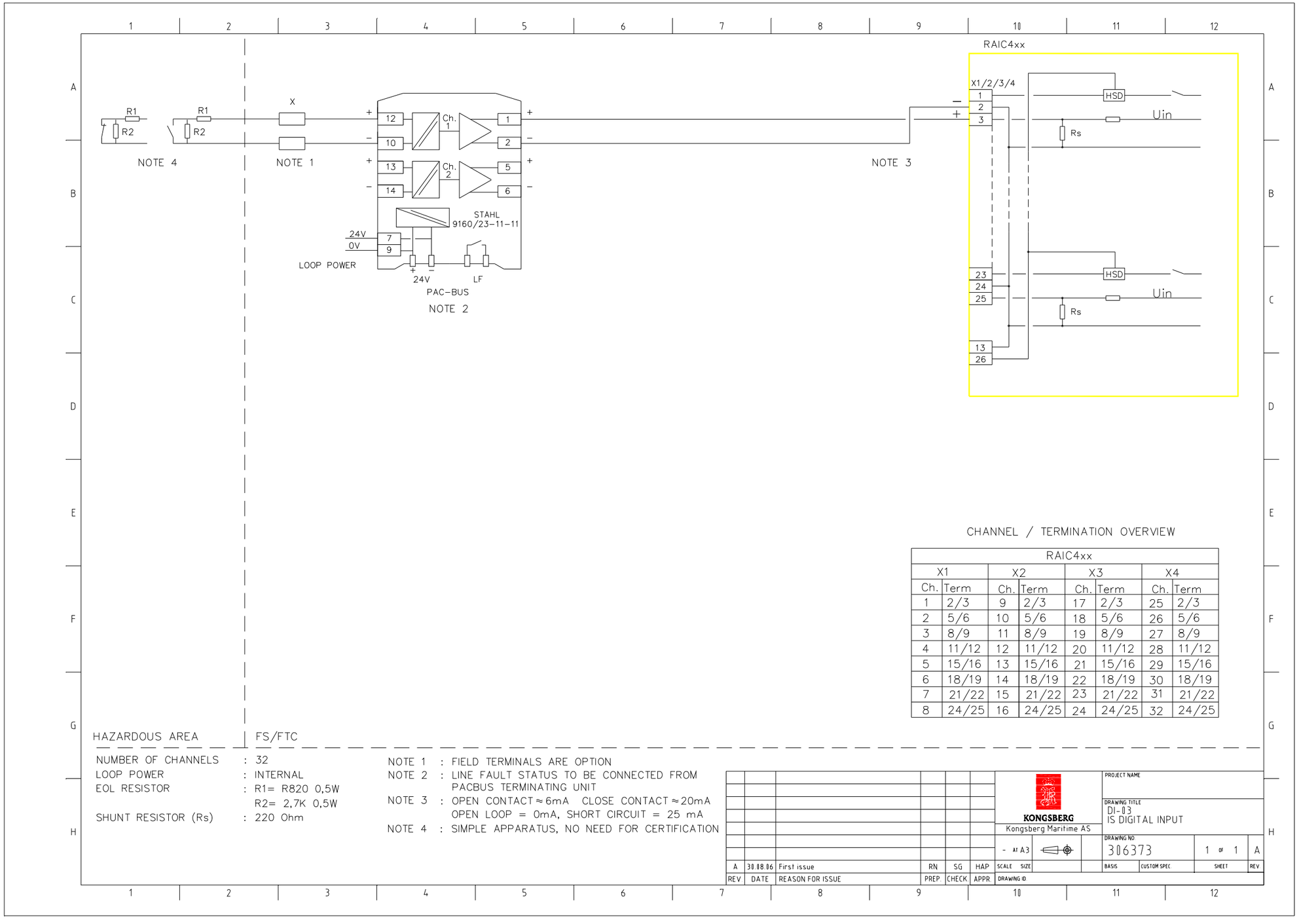


CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3
2	4/6	10	4/6	18	4/6
3	7/9	11	7/9	19	7/9
4	10/12	12	10/12	20	10/12
5	14/16	13	14/16		
6	17/19	14	17/19		
7	20/22	15	20/22		
8	23/25	16	23/25		

RDIOR4xx			
X2		X3	
Ch.	Term	Ch.	Term
9	1/3	17	1/3
10	4/6	18	4/6
11	7/9	19	7/9
12	10/12	20	10/12
13	14/16	21	14/16
14	17/19	22	17/19
15	20/22	23	20/22
16	23/25	24	23/25

RDIO4xx / RDIO4xxS / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3	25	1/3
2	4/6	10	4/6	18	4/6	26	4/6
3	7/9	11	7/9	19	7/9	27	7/9
4	10/12	12	10/12	20	10/12	28	10/12
5	14/16	13	14/16	21	14/16	29	14/16
6	17/19	14	17/19	22	17/19	30	17/19
7	20/22	15	20/22	23	20/22	31	20/22
8	23/25	16	23/25	24	23/25	32	23/25



CHANNEL / TERMINATION OVERVIEW

RAIC4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

HAZARDOUS AREA | FS/FTC

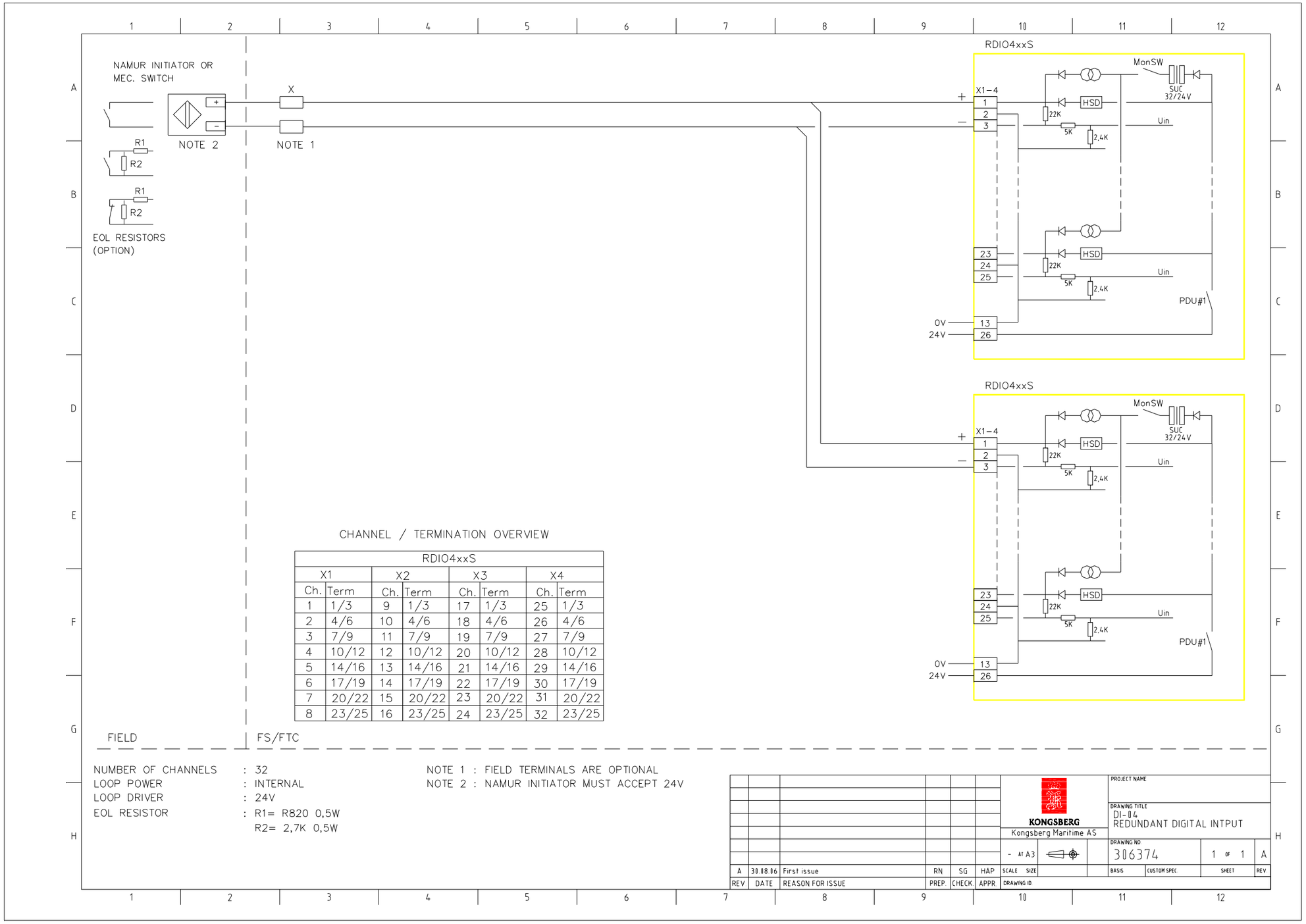
NUMBER OF CHANNELS : 32
LOOP POWER : INTERNAL
EOL RESISTOR : R1= R820 0,5W
R2= 2,7K 0,5W
SHUNT RESISTOR (Rs) : 220 Ohm

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 3 : OPEN CONTACT ≈ 6mA CLOSE CONTACT ≈ 20mA
OPEN LOOP = 0mA, SHORT CIRCUIT = 25 mA
NOTE 4 : SIMPLE APPARATUS, NO NEED FOR CERTIFICATION

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: DI-03 IS DIGITAL INPUT
DRAWING NO: 306373
SCALE: - AT A3 | BASIS | CUSTOM SPEC. | SHEET: 1 OF 1 | REV: A
DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RDIO4xxS							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3	25	1/3
2	4/6	10	4/6	18	4/6	26	4/6
3	7/9	11	7/9	19	7/9	27	7/9
4	10/12	12	10/12	20	10/12	28	10/12
5	14/16	13	14/16	21	14/16	29	14/16
6	17/19	14	17/19	22	17/19	30	17/19
7	20/22	15	20/22	23	20/22	31	20/22
8	23/25	16	23/25	24	23/25	32	23/25

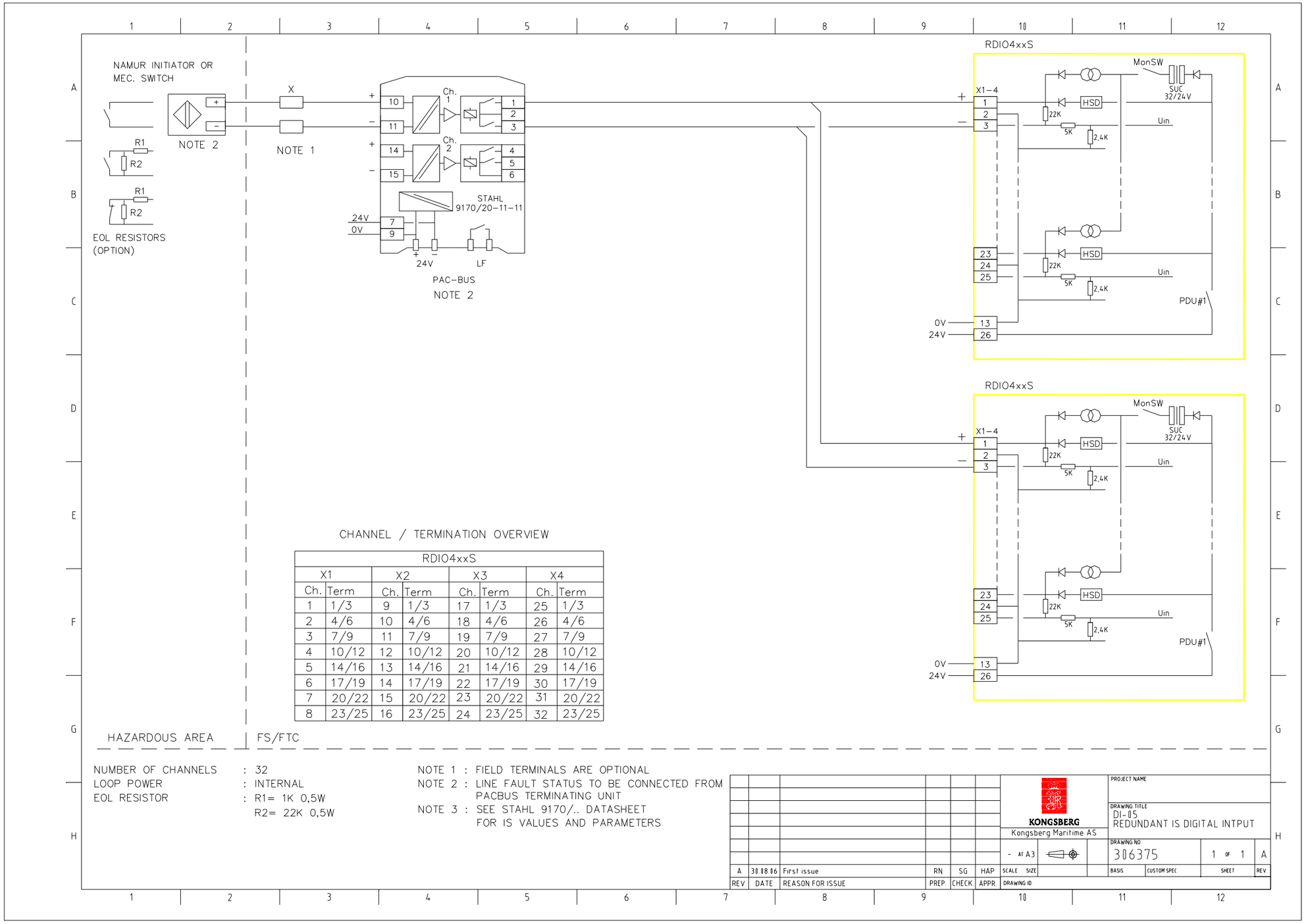
NUMBER OF CHANNELS : 32
LOOP POWER : INTERNAL
LOOP DRIVER : 24V
EOL RESISTOR : R1= R820 0,5W
R2= 2,7K 0,5W

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : NAMUR INITIATOR MUST ACCEPT 24V

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE
DI-04
REDUNDANT DIGITAL INTPUT
DRAWING NO
306374
1 OF 1
A
SCALE - AT A3
SIZE
BASIS
CUSTOM SPEC.
SHEET
REV.
DRAWING ID.



CHANNEL / TERMINATION OVERVIEW

RDIO4xxS							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/3	9	1/3	17	1/3	25	1/3
2	4/6	10	4/6	18	4/6	26	4/6
3	7/9	11	7/9	19	7/9	27	7/9
4	10/12	12	10/12	20	10/12	28	10/12
5	14/16	13	14/16	21	14/16	29	14/16
6	17/19	14	17/19	22	17/19	30	17/19
7	20/22	15	20/22	23	20/22	31	20/22
8	23/25	16	23/25	24	23/25	32	23/25

HAZARDOUS AREA | FS/FTC

NUMBER OF CHANNELS : 32
LOOP POWER : INTERNAL
EOL RESISTOR : R1= 1K 0,5W
R2= 22K 0,5W

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 3 : SEE STAHL 9170/.. DATASHEET FOR IS VALUES AND PARAMETERS

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

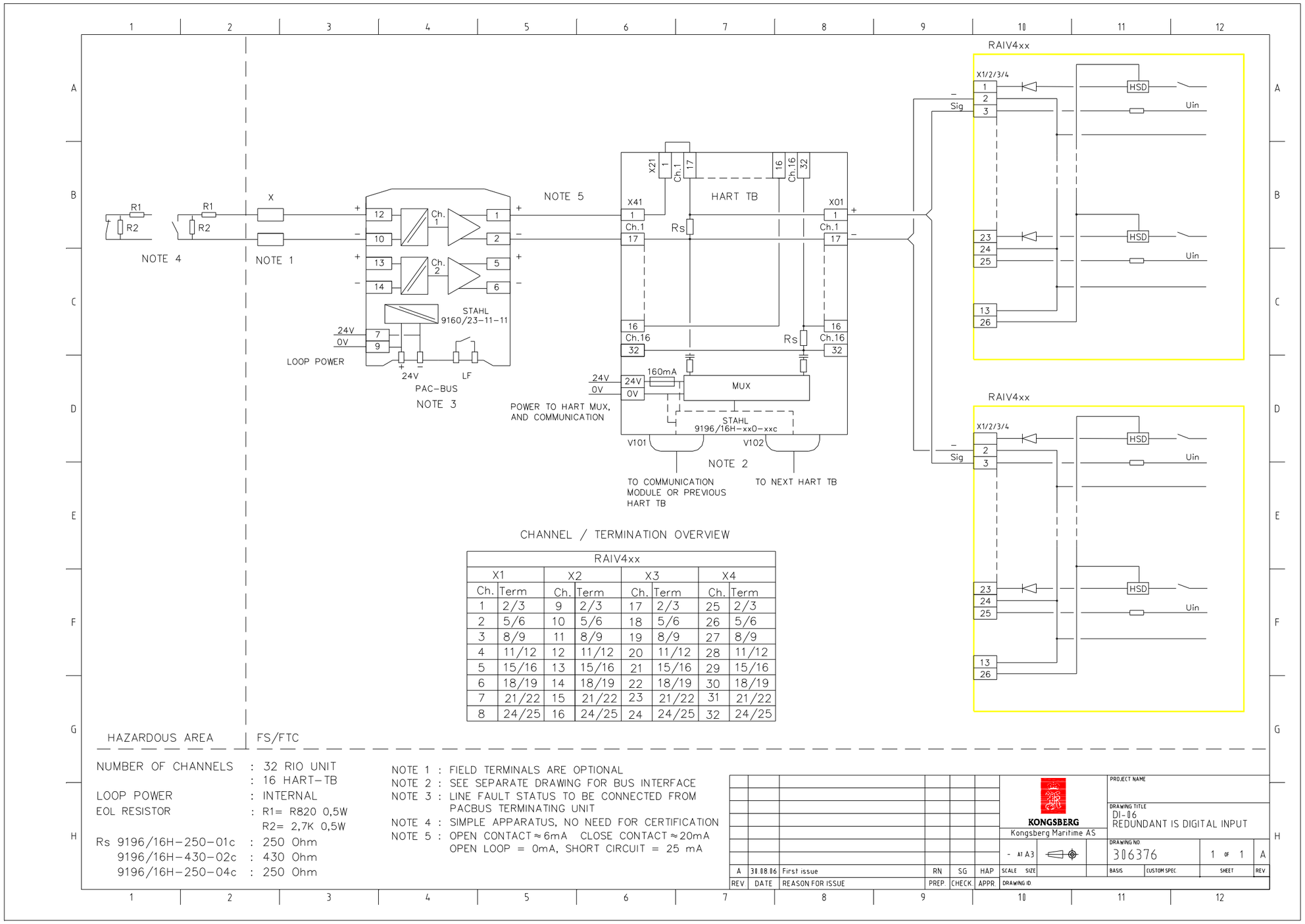
PROJECT NAME

DRAWING TITLE
DI-05
REDUNDANT IS DIGITAL INTPUT

DRAWING NO
306375

SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV A

DRAWING ID.



CHANNEL / TERMINATION OVERVIEW

RAIV4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2/3	9	2/3	17	2/3	25	2/3
2	5/6	10	5/6	18	5/6	26	5/6
3	8/9	11	8/9	19	8/9	27	8/9
4	11/12	12	11/12	20	11/12	28	11/12
5	15/16	13	15/16	21	15/16	29	15/16
6	18/19	14	18/19	22	18/19	30	18/19
7	21/22	15	21/22	23	21/22	31	21/22
8	24/25	16	24/25	24	24/25	32	24/25

HAZARDOUS AREA | FS/FTC

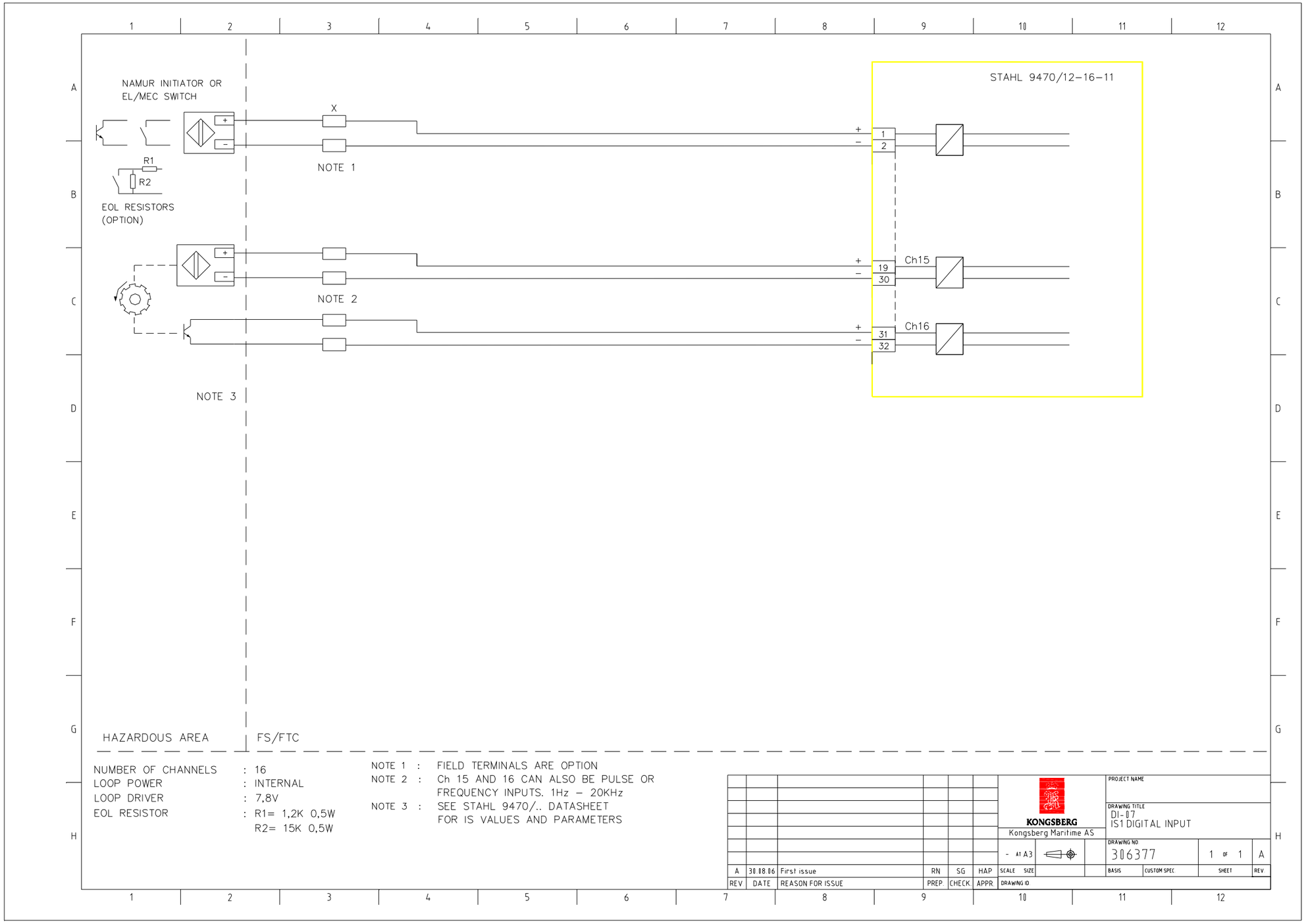
NUMBER OF CHANNELS : 32 RIO UNIT
: 16 HART-TB
LOOP POWER : INTERNAL
EOL RESISTOR : R1= R820 0,5W
R2= 2,7K 0,5W
Rs 9196/16H-250-01c : 250 Ohm
9196/16H-430-02c : 430 Ohm
9196/16H-250-04c : 250 Ohm

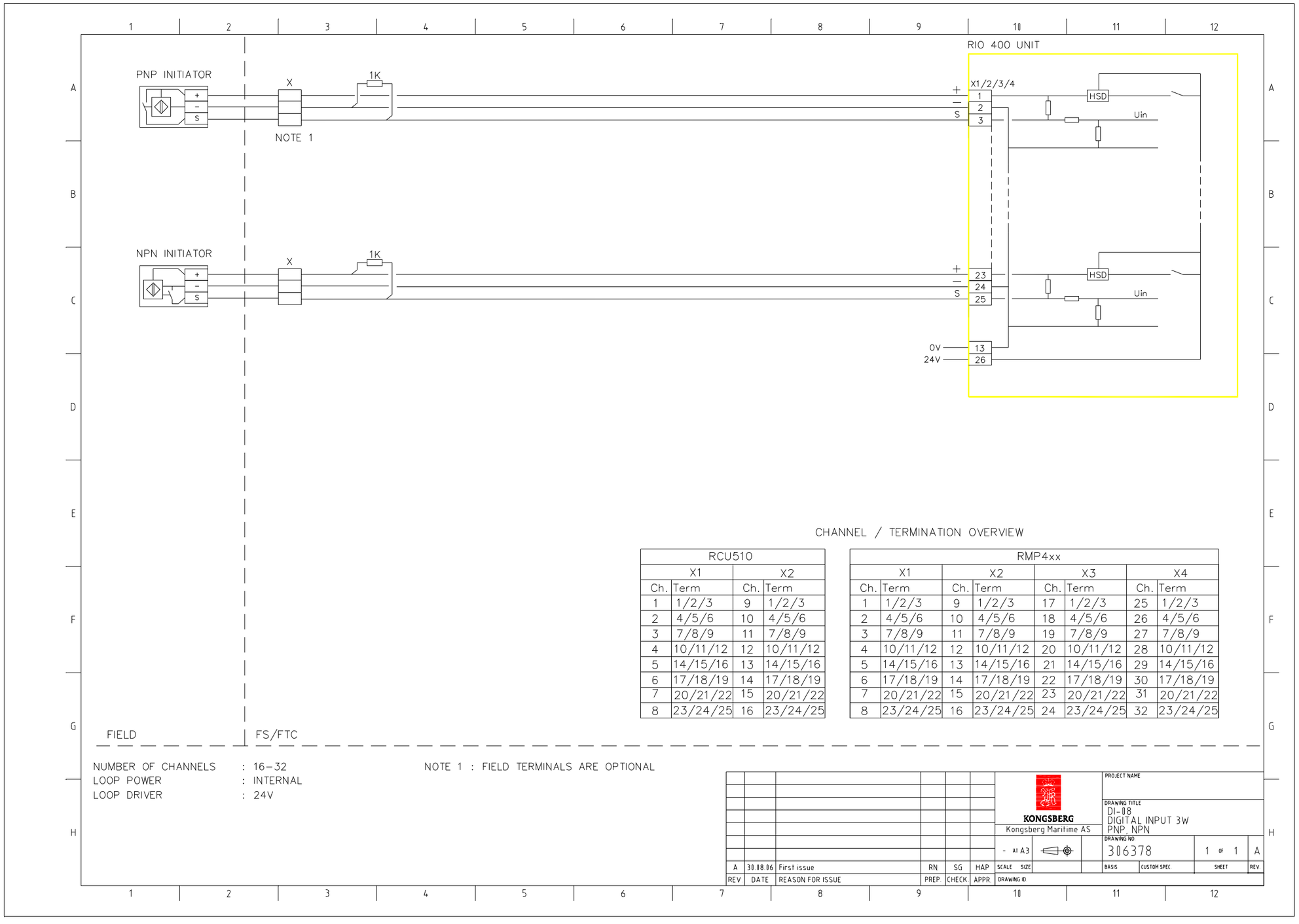
NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR BUS INTERFACE
NOTE 3 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 4 : SIMPLE APPARATUS, NO NEED FOR CERTIFICATION
NOTE 5 : OPEN CONTACT ≈6mA CLOSE CONTACT ≈20mA
OPEN LOOP = 0mA, SHORT CIRCUIT = 25 mA

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: DI-06 REDUNDANT IS DIGITAL INPUT
DRAWING NO: 306376
SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV A
DRAWING ID

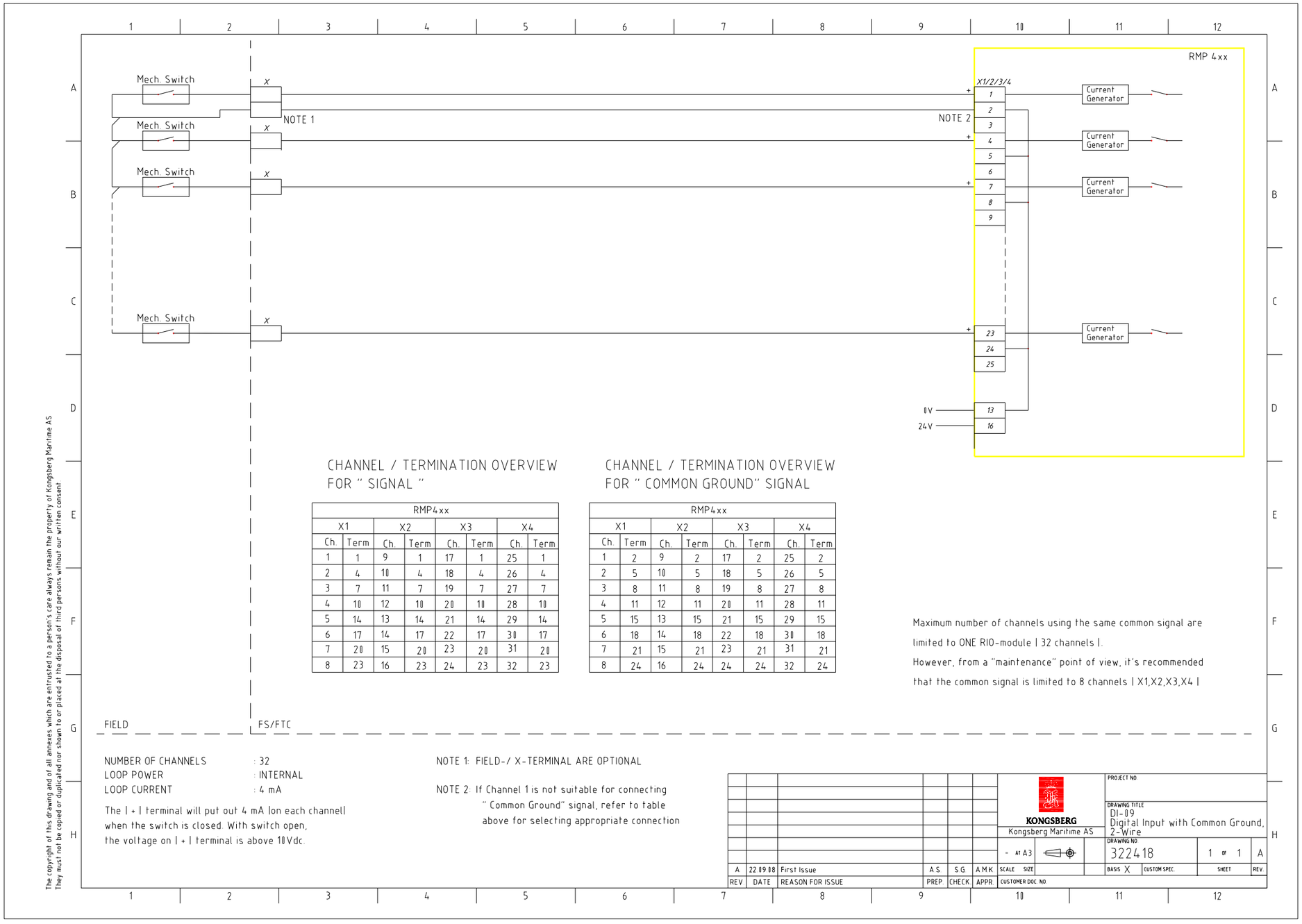

NAMUR INITIATOR OR
EL/MEC SWITCH
R1
R2
EOL RESISTORS
(OPTION)
X
NOTE 1
NOTE 2
NOTE 3
STAHL 9470/12-16-11
1
2
19
30
31
32
Ch15
Ch16
HAZARDOUS AREA
FS/FTC
NUMBER OF CHANNELS : 16
LOOP POWER : INTERNAL
LOOP DRIVER : 7,8V
EOL RESISTOR : R1= 1,2K 0,5W
R2= 15K 0,5W
NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : Ch 15 AND 16 CAN ALSO BE PULSE OR FREQUENCY INPUTS. 1Hz – 20KHz
NOTE 3 : SEE STAHL 9470/.. DATASHEET FOR IS VALUES AND PARAMETERS
A 30.08.06 First issue RN SG HAP
REV DATE REASON FOR ISSUE PREP. CHECK. APPR.
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
DI-07
IS1 DIGITAL INPUT
DRAWING NO
306377
1 OF 1 A
SCALE - A1 A3 SIZE
BASIS CUSTOM SPEC SHEET REV.
DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RCU510			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3
2	4/5/6	10	4/5/6
3	7/8/9	11	7/8/9
4	10/11/12	12	10/11/12
5	14/15/16	13	14/15/16
6	17/18/19	14	17/18/19
7	20/21/22	15	20/21/22
8	23/24/25	16	23/24/25

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2/3	9	1/2/3	17	1/2/3	25	1/2/3
2	4/5/6	10	4/5/6	18	4/5/6	26	4/5/6
3	7/8/9	11	7/8/9	19	7/8/9	27	7/8/9
4	10/11/12	12	10/11/12	20	10/11/12	28	10/11/12
5	14/15/16	13	14/15/16	21	14/15/16	29	14/15/16
6	17/18/19	14	17/18/19	22	17/18/19	30	17/18/19
7	20/21/22	15	20/21/22	23	20/21/22	31	20/21/22
8	23/24/25	16	23/24/25	24	23/24/25	32	23/24/25



CHANNEL / TERMINATION OVERVIEW FOR " SIGNAL "

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1	9	1	17	1	25	1
2	4	10	4	18	4	26	4
3	7	11	7	19	7	27	7
4	10	12	10	20	10	28	10
5	14	13	14	21	14	29	14
6	17	14	17	22	17	30	17
7	20	15	20	23	20	31	20
8	23	16	23	24	23	32	23

CHANNEL / TERMINATION OVERVIEW FOR " COMMON GROUND" SIGNAL

RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	2	9	2	17	2	25	2
2	5	10	5	18	5	26	5
3	8	11	8	19	8	27	8
4	11	12	11	20	11	28	11
5	15	13	15	21	15	29	15
6	18	14	18	22	18	30	18
7	21	15	21	23	21	31	21
8	24	16	24	24	24	32	24

Maximum number of channels using the same common signal are limited to ONE RIO-module (32 channels).
However, from a "maintenance" point of view, it's recommended that the common signal is limited to 8 channels (X1,X2,X3,X4)

NUMBER OF CHANNELS : 32
LOOP POWER : INTERNAL
LOOP CURRENT : 4 mA

The (+) terminal will put out 4 mA (on each channell) when the switch is closed. With switch open, the voltage on (+) terminal is above 10Vdc.

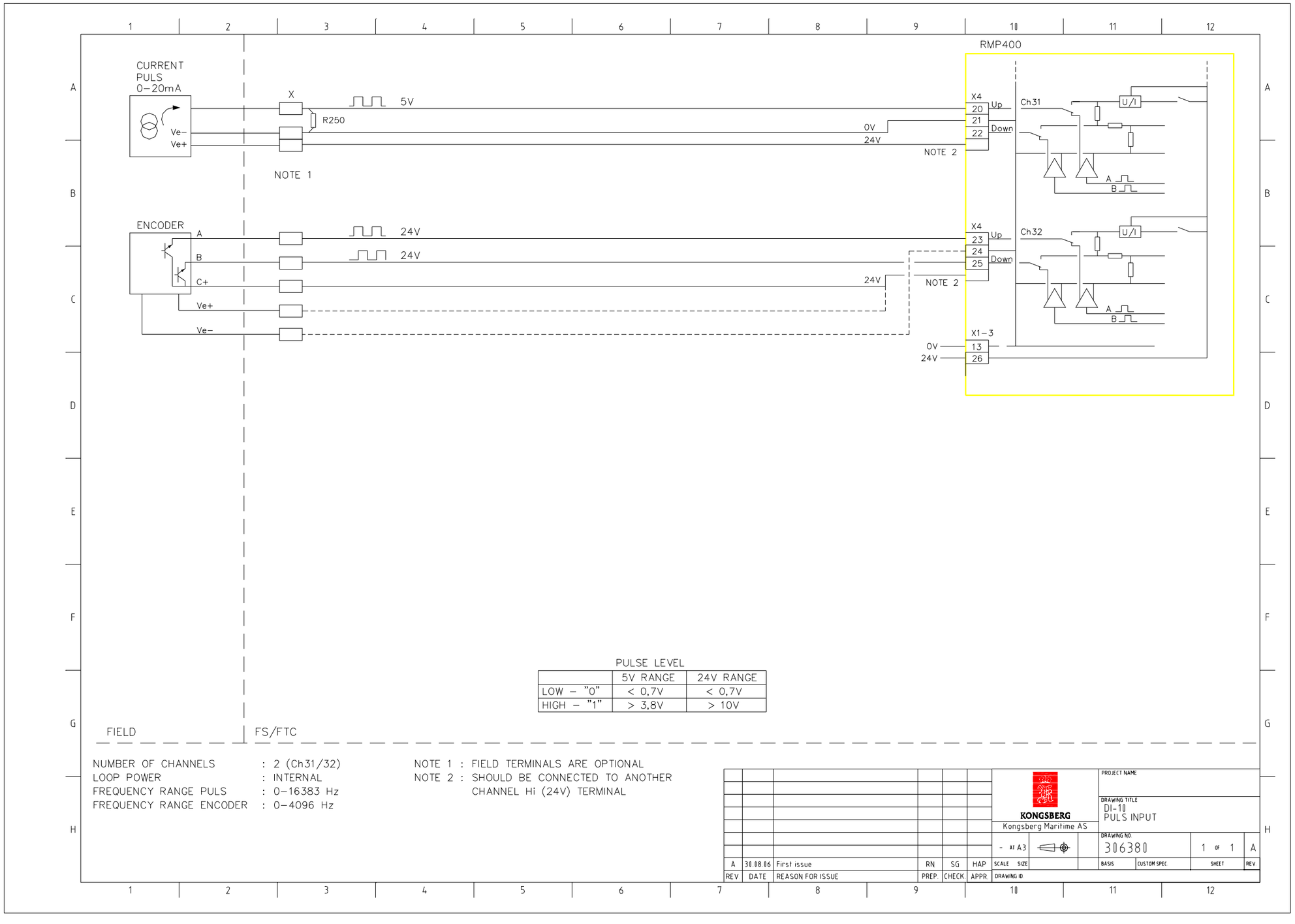
NOTE 1: FIELD-/ X-TERMINAL ARE OPTIONAL

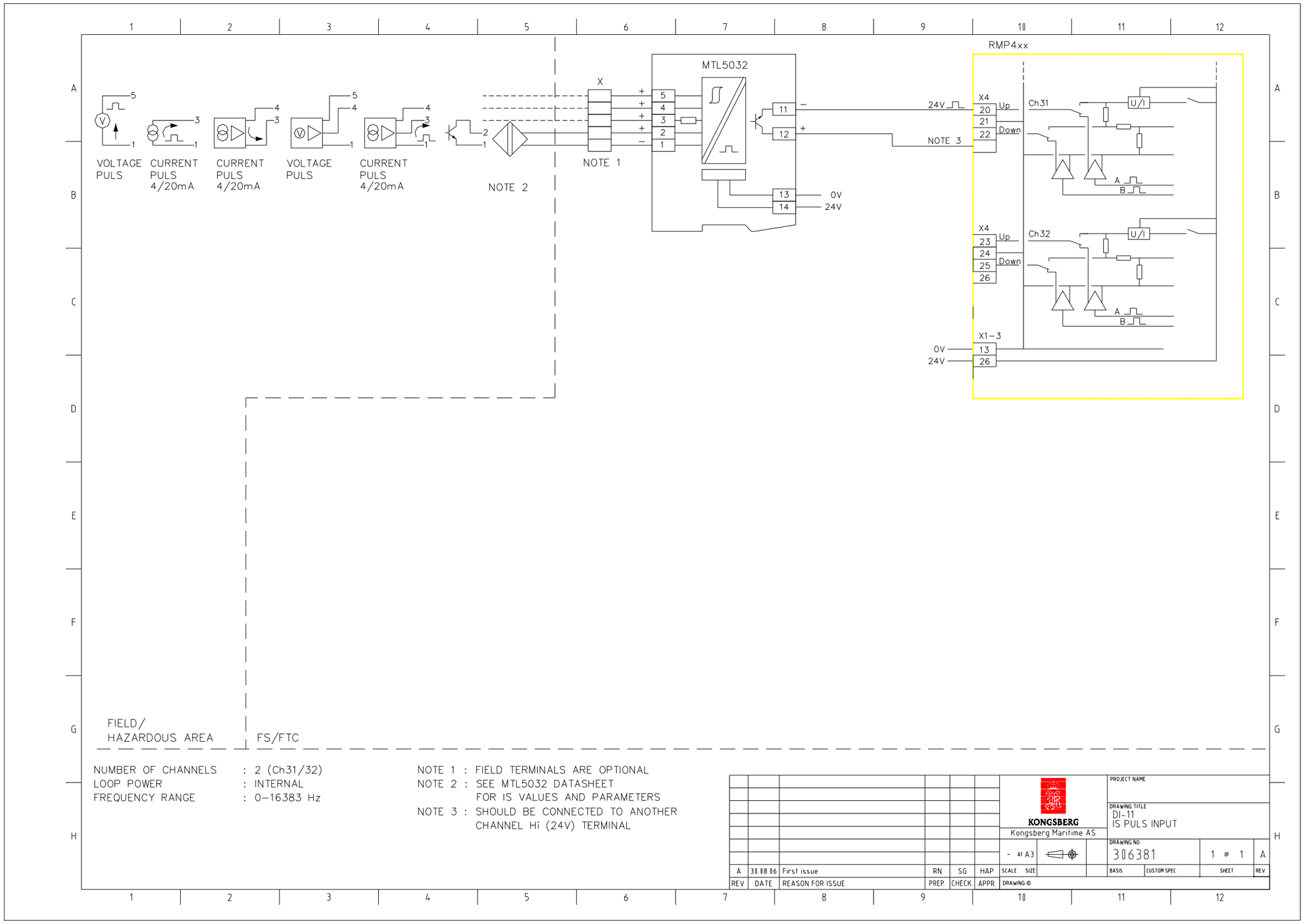
NOTE 2: If Channel 1 is not suitable for connecting " Common Ground" signal, refer to table above for selecting appropriate connection

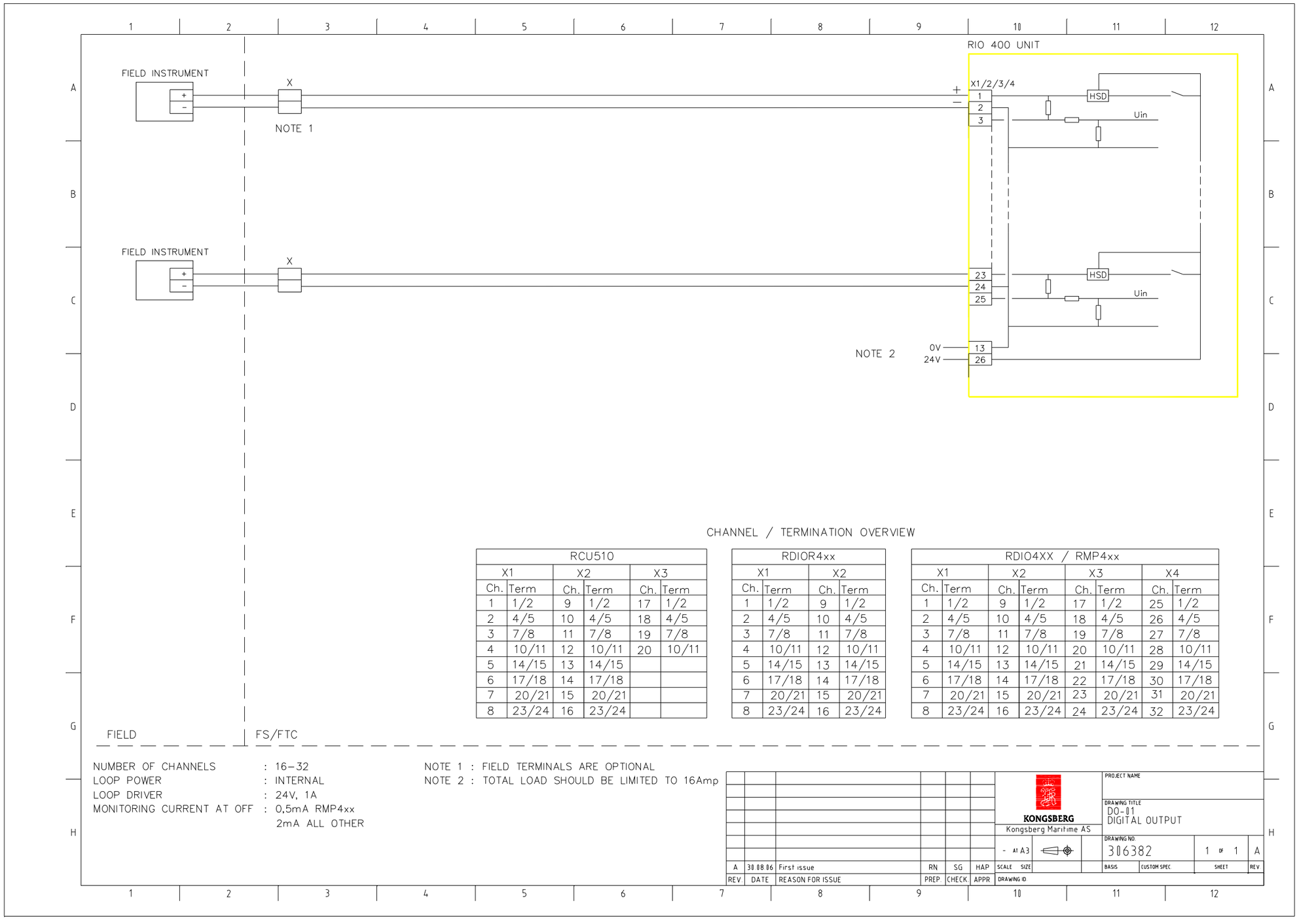
REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	22.09.08	First issue	A.S.	S.G.	A.M.K.

KONGSBERG
Kongsberg Maritime AS

PROJECT NO.
DRAWING TITLE: DI-09 Digital Input with Common Ground, 2-Wire
DRAWING NO: 322418
SCALE - AT A3 | SIZE | BASIS X | CUSTOM SPEC. | SHEET 1 OF 1 | REV. A
CUSTOMER DOC. NO.


RMP400
CURRENT
PULS
0–20mA
Ve–
Ve+
X
R250
5V
NOTE 1
0V
24V
NOTE 2
X4
20
21
22
Up
Down
Ch31
U/I
A
B
ENCODER
A
B
C+
Ve+
Ve–
24V
24V
24V
NOTE 2
X4
23
24
25
Up
Down
Ch32
U/I
A
B
X1–3
13
26
0V
24V
PULSE LEVEL
5V RANGE
24V RANGE
LOW – "0" < 0,7V < 0,7V
HIGH – "1" > 3,8V > 10V
FIELD
FS/FTC
NUMBER OF CHANNELS : 2 (Ch31/32)
LOOP POWER : INTERNAL
FREQUENCY RANGE PULS : 0–16383 Hz
FREQUENCY RANGE ENCODER : 0–4096 Hz
NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SHOULD BE CONNECTED TO ANOTHER CHANNEL Hi (24V) TERMINAL
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
DI-10
PULS INPUT
DRAWING NO.
306380
1 OF 1
A
A 30.08.06 First issue RN SG HAP
REV DATE REASON FOR ISSUE PREP. CHECK APPR.
SCALE SIZE
BASIS
CUSTOM SPEC.
SHEET
REV.
DRAWING ID.


RMP4xx
MTL5032
X
VOLTAGE PULS
CURRENT PULS 4/20mA
CURRENT PULS 4/20mA
VOLTAGE PULS
CURRENT PULS 4/20mA
NOTE 1
NOTE 2
NOTE 3
24V
0V
X4
Up
Down
Ch31
Ch32
U/I
A
B
X1–3
FIELD/ HAZARDOUS AREA
FS/FTC
NUMBER OF CHANNELS : 2 (Ch31/32)
LOOP POWER : INTERNAL
FREQUENCY RANGE : 0–16383 Hz
NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE MTL5032 DATASHEET FOR IS VALUES AND PARAMETERS
NOTE 3 : SHOULD BE CONNECTED TO ANOTHER CHANNEL Hi (24V) TERMINAL
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
DI-11
IS PULS INPUT
DRAWING NO.
306381
- AT A3
1 OF 1
A
30.08.06
First issue
REV
DATE
REASON FOR ISSUE
PREP.
CHECK
APPR.
SCALE
SIZE
BASIS
CUSTOM SPEC.
SHEET
REV.
DRAWING ID.



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2
2	4/5	10	4/5	18	4/5
3	7/8	11	7/8	19	7/8
4	10/11	12	10/11	20	10/11
5	14/15	13	14/15		
6	17/18	14	17/18		
7	20/21	15	20/21		
8	23/24	16	23/24		

RDIOR4xx			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2	9	1/2
2	4/5	10	4/5
3	7/8	11	7/8
4	10/11	12	10/11
5	14/15	13	14/15
6	17/18	14	17/18
7	20/21	15	20/21
8	23/24	16	23/24

RDIO4XX / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

FIELD | FS/FTC

NUMBER OF CHANNELS : 16–32
LOOP POWER : INTERNAL
LOOP DRIVER : 24V, 1A
MONITORING CURRENT AT OFF : 0,5mA RMP4xx
2mA ALL OTHER

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : TOTAL LOAD SHOULD BE LIMITED TO 16Amp

REV.	DATE	REASON FOR ISSUE	PREP	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

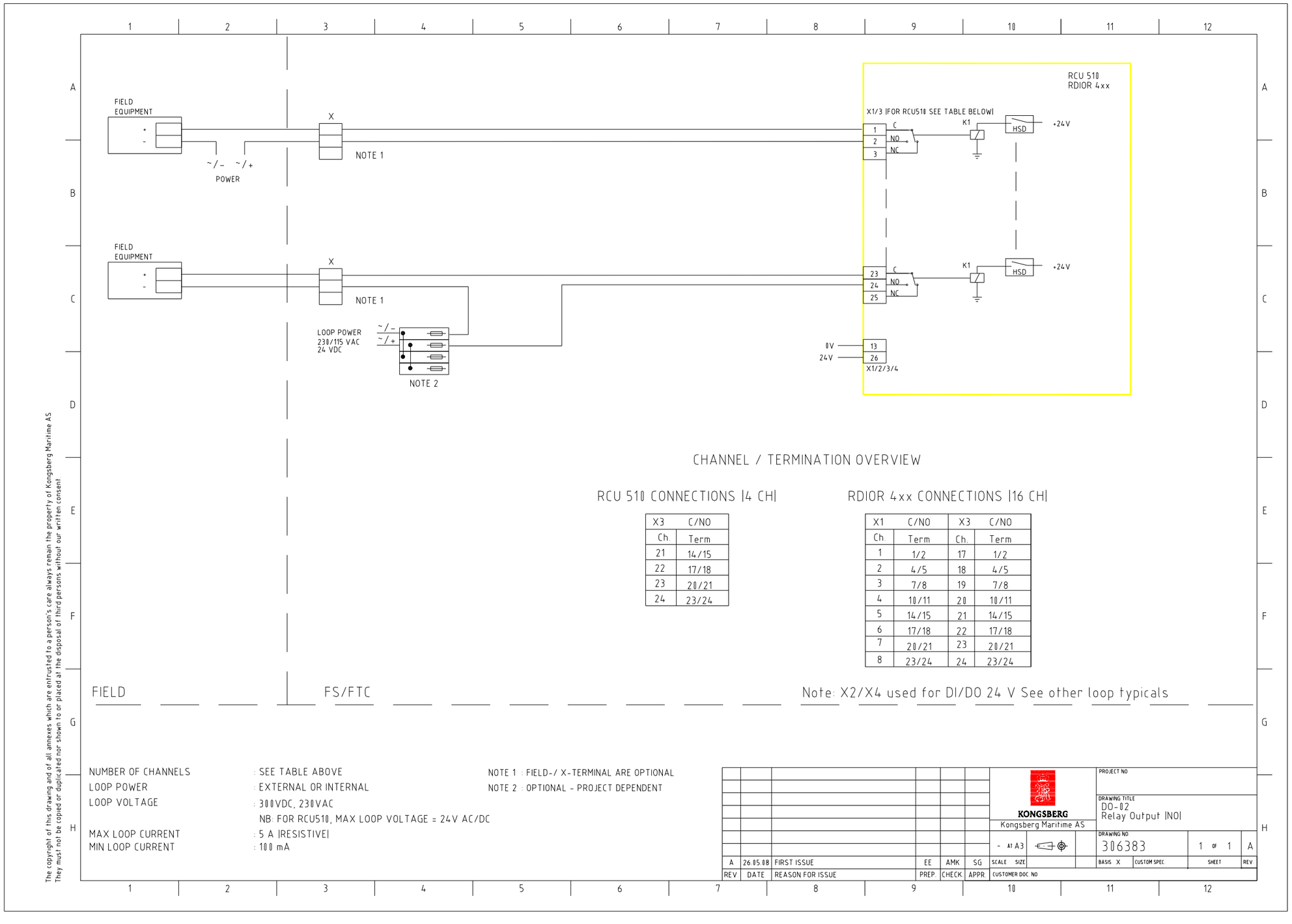
PROJECT NAME

DRAWING TITLE
DO-01
DIGITAL OUTPUT

DRAWING NO.
306382

SCALE - AT A3 | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV. A

DRAWING ID


FIELD EQUIPMENT
+
-
~/-
~/+
POWER
X
NOTE 1
FIELD EQUIPMENT
+
-
X
NOTE 1
LOOP POWER
230/115 VAC
24 VDC
~/-
~/+
NOTE 2
RCU 510
RDIOR 4xx
X1/3 IFOR RCU510 SEE TABLE BELOWI
1
2
3
C
NO
NC
K1
HSD
+24V
23
24
25
C
NO
NC
K1
HSD
+24V
0V
24V
13
26
X1/2/3/4
CHANNEL / TERMINATION OVERVIEW
RCU 510 CONNECTIONS (4 CH)
X3 C/NO
Ch. Term
21 14/15
22 17/18
23 20/21
24 23/24
RDIOR 4xx CONNECTIONS (16 CH)
X1 C/NO X3 C/NO
Ch. Term Ch. Term
1 1/2 17 1/2
2 4/5 18 4/5
3 7/8 19 7/8
4 10/11 20 10/11
5 14/15 21 14/15
6 17/18 22 17/18
7 20/21 23 20/21
8 23/24 24 23/24
FIELD
FS/FTC
Note: X2/X4 used for DI/DO 24 V See other loop typicals
NUMBER OF CHANNELS : SEE TABLE ABOVE
LOOP POWER : EXTERNAL OR INTERNAL
LOOP VOLTAGE : 300VDC, 230VAC
NB: FOR RCU510, MAX LOOP VOLTAGE = 24V AC/DC
MAX LOOP CURRENT : 5 A (RESISTIVE)
MIN LOOP CURRENT : 100 mA
NOTE 1 : FIELD-/ X-TERMINAL ARE OPTIONAL
NOTE 2 : OPTIONAL - PROJECT DEPENDENT
A 26.05.08 FIRST ISSUE EE AMK SG
REV DATE REASON FOR ISSUE PREP. CHECK APPR.
KONGSBERG
Kongsberg Maritime AS
PROJECT NO
DRAWING TITLE
DO-02
Relay Output (NO)
DRAWING NO
306383
1 OF 1
A
- AT A3
SCALE SIZE
BASIS X
CUSTOM SPEC.
SHEET
REV.
CUSTOMER DOC NO
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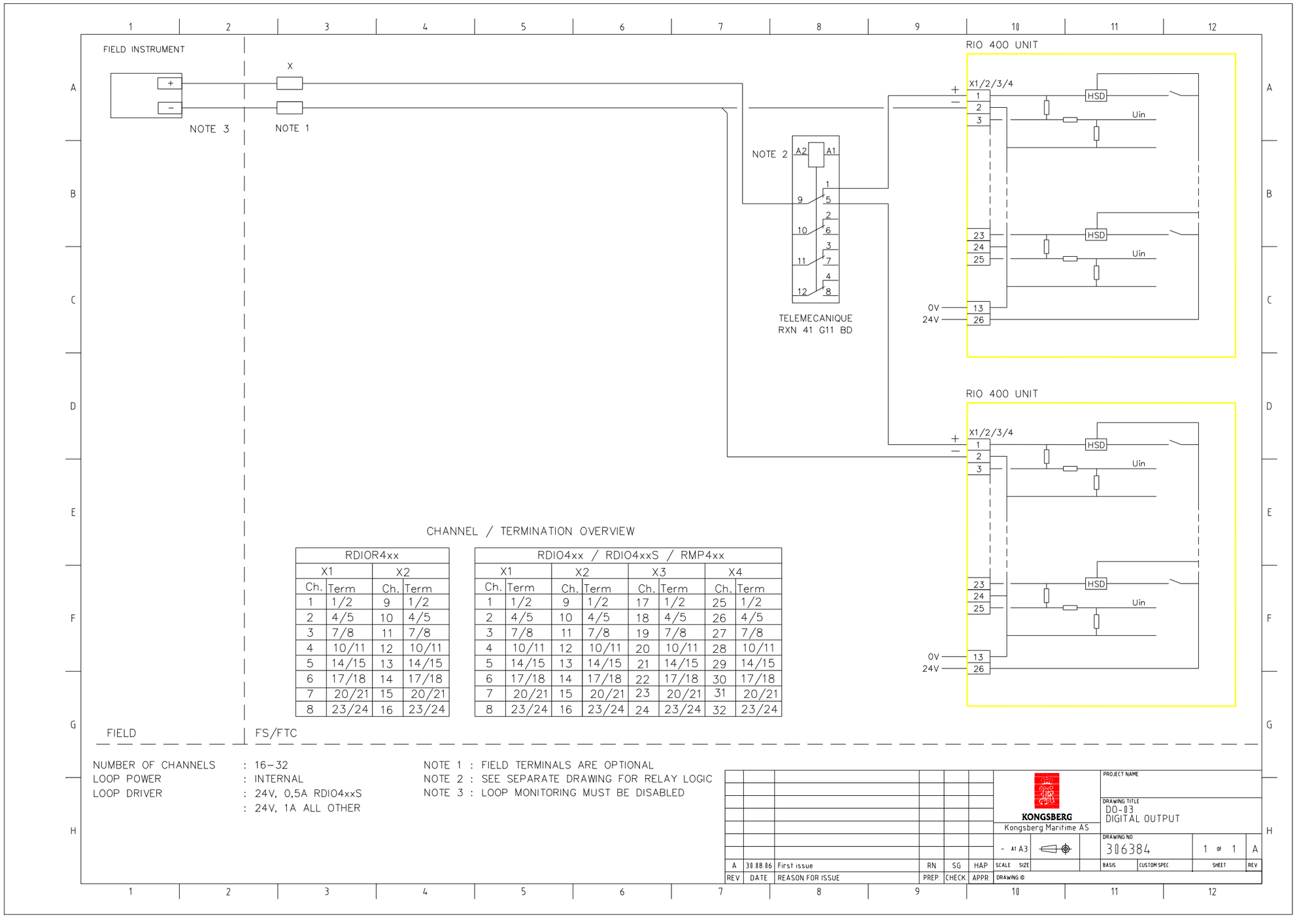


CHANNEL / TERMINATION OVERVIEW

RDIOR4xx			
X1		X2	
Ch.	Term	Ch.	Term
1	1/2	9	1/2
2	4/5	10	4/5
3	7/8	11	7/8
4	10/11	12	10/11
5	14/15	13	14/15
6	17/18	14	17/18
7	20/21	15	20/21
8	23/24	16	23/24

RDIO4xx / RDIO4xxS / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

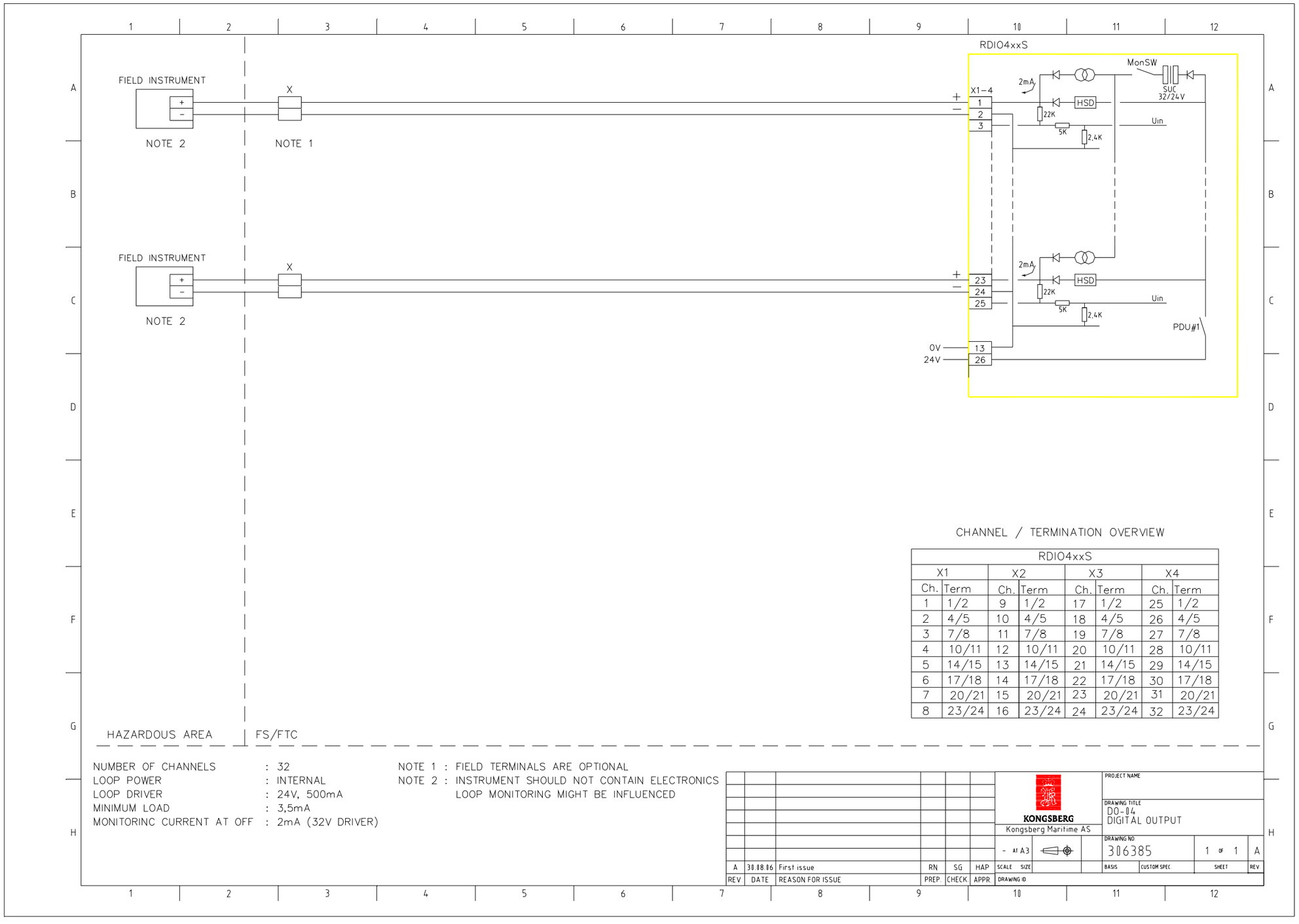
NUMBER OF CHANNELS : 16–32
LOOP POWER : INTERNAL
LOOP DRIVER : 24V, 0,5A RDIO4xxS
: 24V, 1A ALL OTHER

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : SEE SEPARATE DRAWING FOR RELAY LOGIC
NOTE 3 : LOOP MONITORING MUST BE DISABLED

REV	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR.
A	30.08.06	First issue	RN	SG	HAP

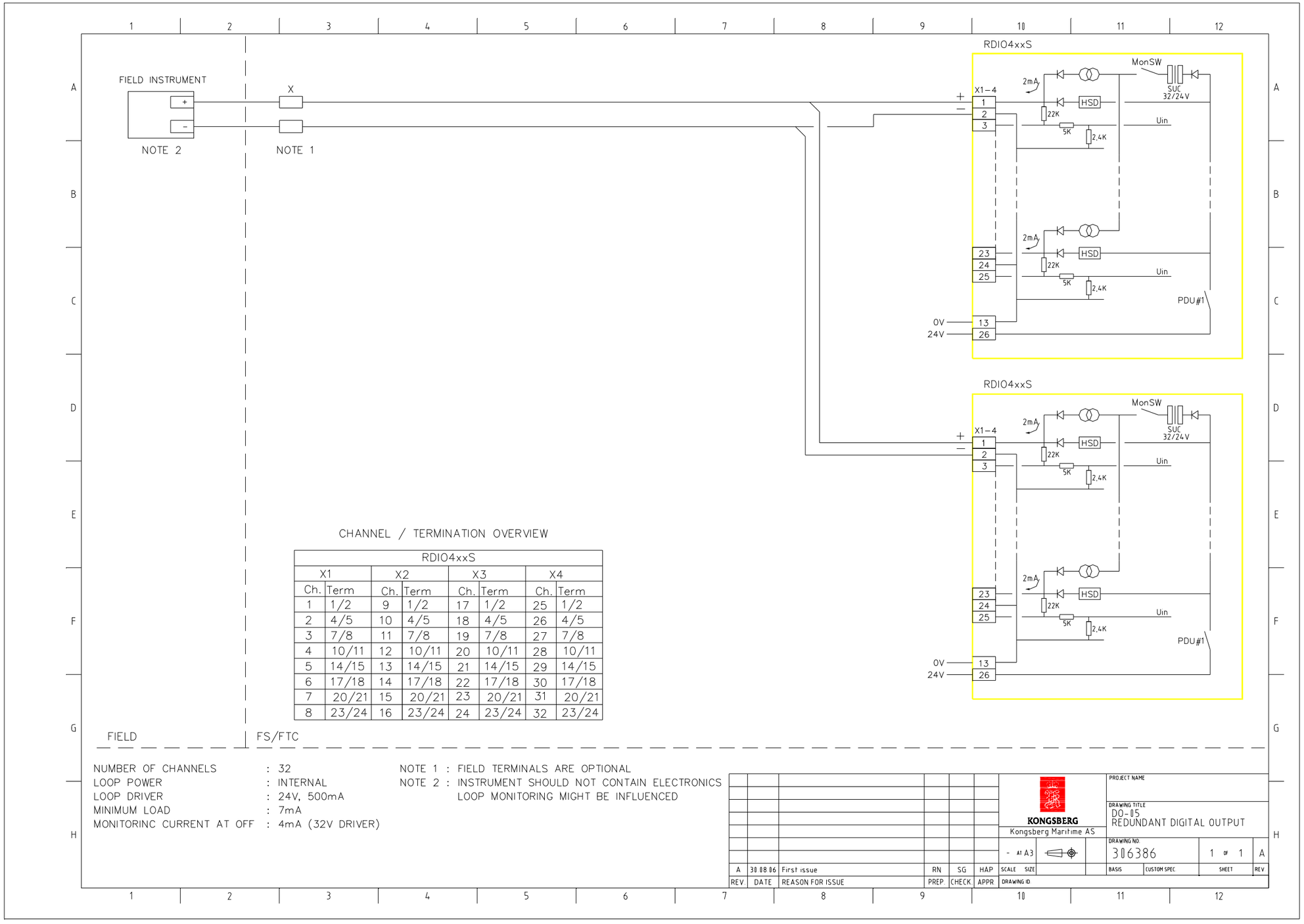
KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: DO-03 DIGITAL OUTPUT
DRAWING NO. 306384
SCALE - SIZE A3 | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV A
DRAWING ID



CHANNEL / TERMINATION OVERVIEW

RDIO4xxS							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24



CHANNEL / TERMINATION OVERVIEW

RDIO4xxS							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

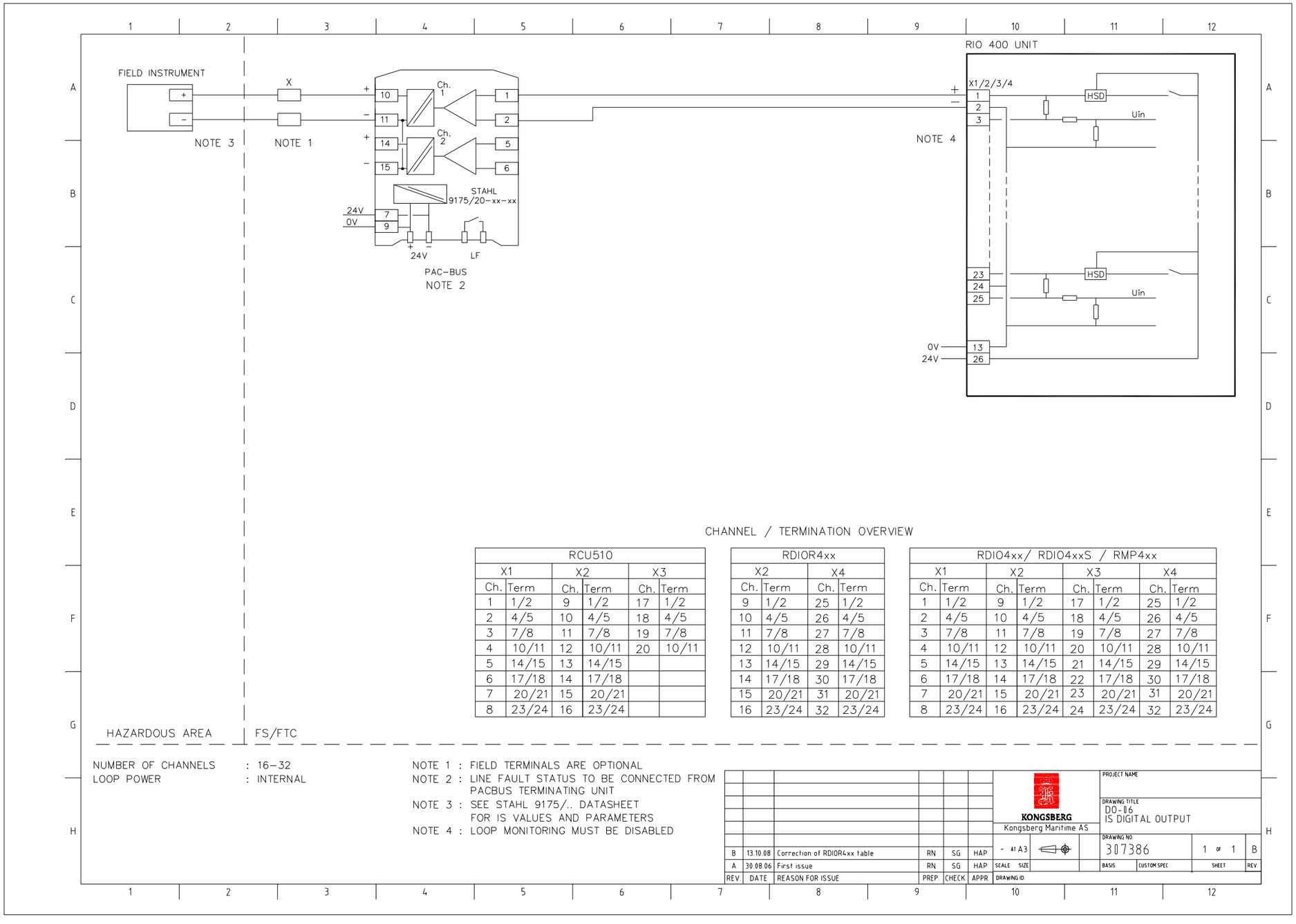
NUMBER OF CHANNELS : 32
LOOP POWER : INTERNAL
LOOP DRIVER : 24V, 500mA
MINIMUM LOAD : 7mA
MONITORINC CURRENT AT OFF : 4mA (32V DRIVER)

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : INSTRUMENT SHOULD NOT CONTAIN ELECTRONICS
LOOP MONITORING MIGHT BE INFLUENCED

REV.	DATE	REASON FOR ISSUE	PREP.	CHECK	APPR
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE
DO-05
REDUNDANT DIGITAL OUTPUT
DRAWING NO.
306386
SCALE - AT A3
SIZE
BASIS
CUSTOM SPEC
SHEET 1 OF 1
REV. A
DRAWING ID.



CHANNEL / TERMINATION OVERVIEW

RCU510					
X1		X2		X3	
Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2
2	4/5	10	4/5	18	4/5
3	7/8	11	7/8	19	7/8
4	10/11	12	10/11	20	10/11
5	14/15	13	14/15		
6	17/18	14	17/18		
7	20/21	15	20/21		
8	23/24	16	23/24		

RDIOR4xx			
X2		X4	
Ch.	Term	Ch.	Term
9	1/2	25	1/2
10	4/5	26	4/5
11	7/8	27	7/8
12	10/11	28	10/11
13	14/15	29	14/15
14	17/18	30	17/18
15	20/21	31	20/21
16	23/24	32	23/24

RDIO4xx/ RDIO4xxS / RMP4xx							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24

NUMBER OF CHANNELS : 16–32
LOOP POWER : INTERNAL

NOTE 1 : FIELD TERMINALS ARE OPTIONAL
NOTE 2 : LINE FAULT STATUS TO BE CONNECTED FROM PACBUS TERMINATING UNIT
NOTE 3 : SEE STAHL 9175/.. DATASHEET FOR IS VALUES AND PARAMETERS
NOTE 4 : LOOP MONITORING MUST BE DISABLED

REV.	DATE	REASON FOR ISSUE	PREP	CHECK	APPR
B	13.10.08	Correction of RDIOR4xx table	RN	SG	HAP
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
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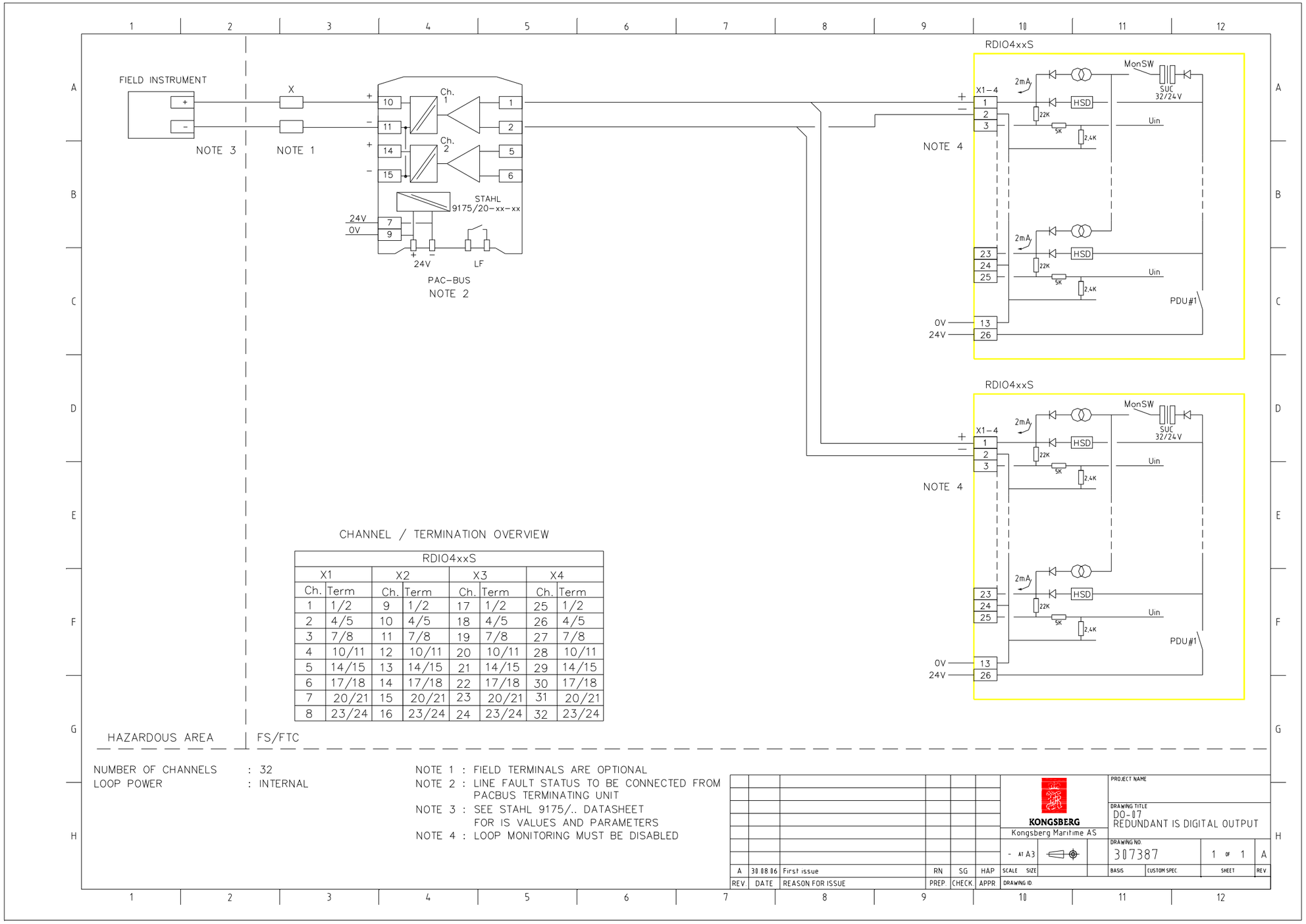
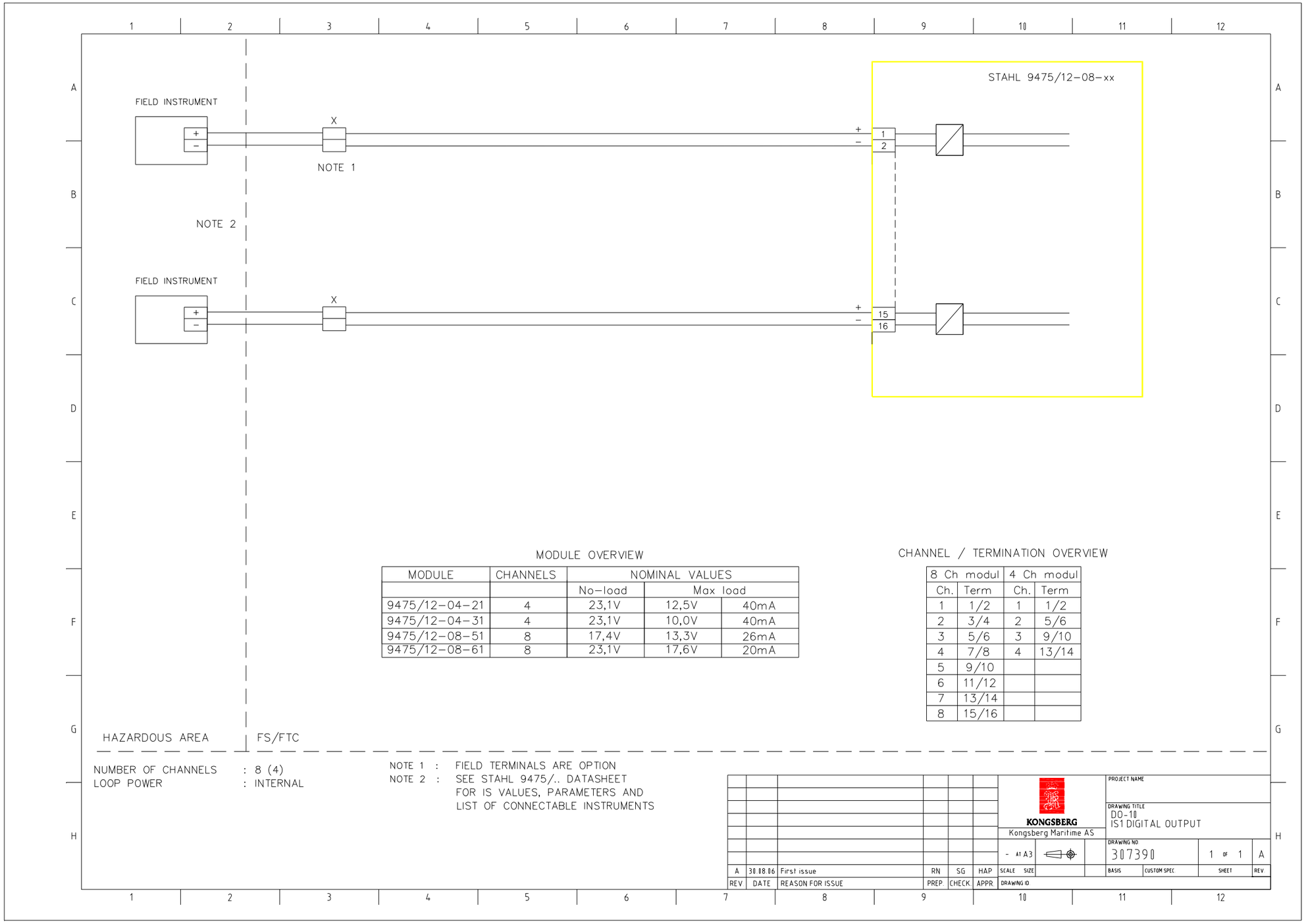
PROJECT NAME
DRAWING TITLE: DO-06 IS DIGITAL OUTPUT
DRAWING NO: 307386
SCALE: - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET: 1 OF 1 | REV: B
DRAWING ID



RDIO4xxS							
X1		X2		X3		X4	
Ch.	Term	Ch.	Term	Ch.	Term	Ch.	Term
1	1/2	9	1/2	17	1/2	25	1/2
2	4/5	10	4/5	18	4/5	26	4/5
3	7/8	11	7/8	19	7/8	27	7/8
4	10/11	12	10/11	20	10/11	28	10/11
5	14/15	13	14/15	21	14/15	29	14/15
6	17/18	14	17/18	22	17/18	30	17/18
7	20/21	15	20/21	23	20/21	31	20/21
8	23/24	16	23/24	24	23/24	32	23/24



MODULE OVERVIEW

MODULE	CHANNELS	NOMINAL VALUES		
		No-load	Max load	
9475/12-04-21	4	23,1V	12,5V	40mA
9475/12-04-31	4	23,1V	10,0V	40mA
9475/12-08-51	8	17,4V	13,3V	26mA
9475/12-08-61	8	23,1V	17,6V	20mA

CHANNEL / TERMINATION OVERVIEW

8 Ch modul		4 Ch modul	
Ch.	Term	Ch.	Term
1	1/2	1	1/2
2	3/4	2	5/6
3	5/6	3	9/10
4	7/8	4	13/14
5	9/10		
6	11/12		
7	13/14		
8	15/16		

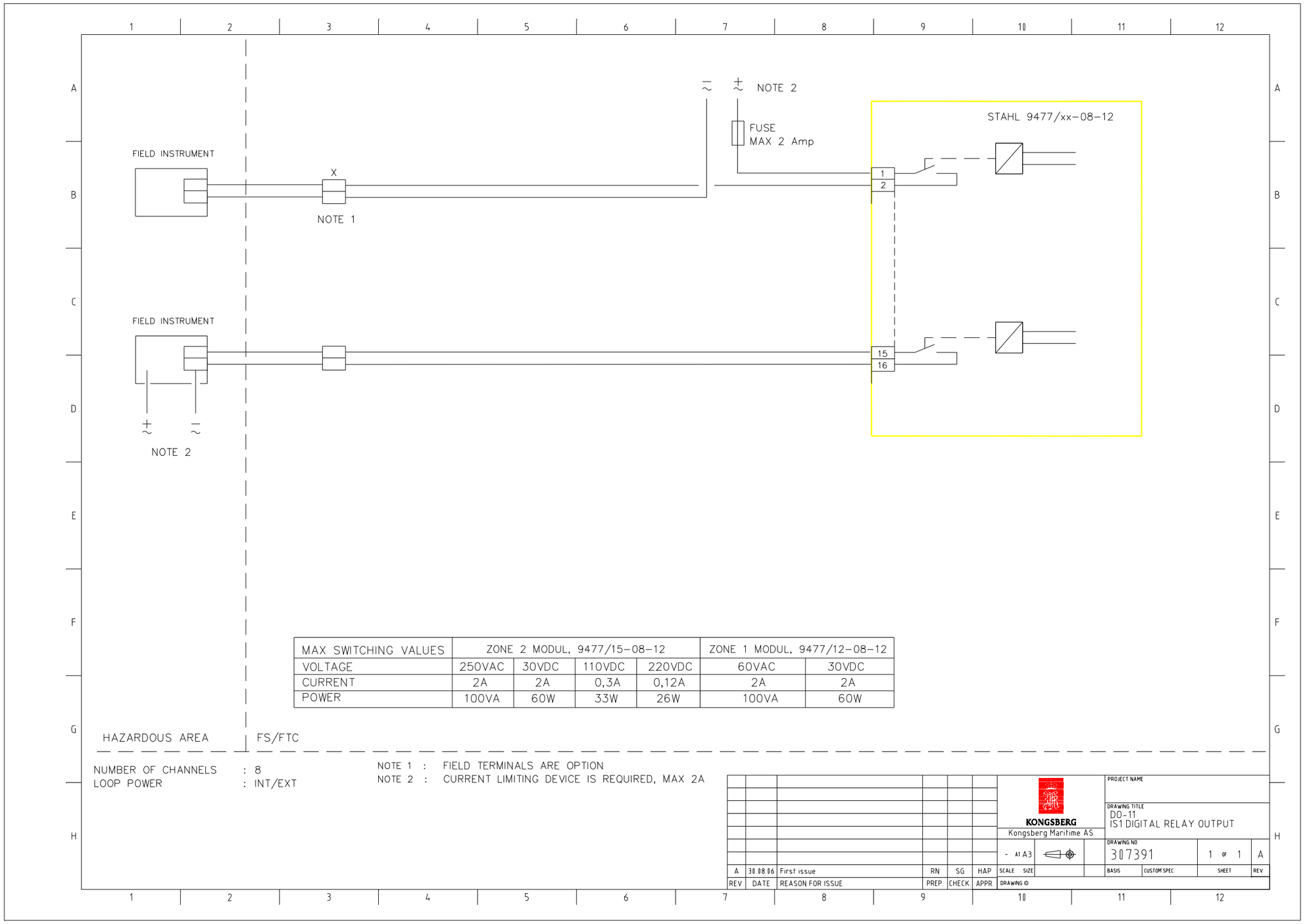
NUMBER OF CHANNELS : 8 (4)
LOOP POWER : INTERNAL

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : SEE STAHL 9475/.. DATASHEET FOR IS VALUES, PARAMETERS AND LIST OF CONNECTABLE INSTRUMENTS

REV	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: DO-10 IS1 DIGITAL OUTPUT
DRAWING NO: 307390
SCALE - A1 A3 | SIZE | BASIS | CUSTOM SPEC | SHEET: 1 OF 1 | REV: A
DRAWING ID



MAX SWITCHING VALUES	ZONE 2 MODUL, 9477/15-08-12				ZONE 1 MODUL, 9477/12-08-12	
VOLTAGE	250VAC	30VDC	110VDC	220VDC	60VAC	30VDC
CURRENT	2A	2A	0,3A	0,12A	2A	2A
POWER	100VA	60W	33W	26W	100VA	60W

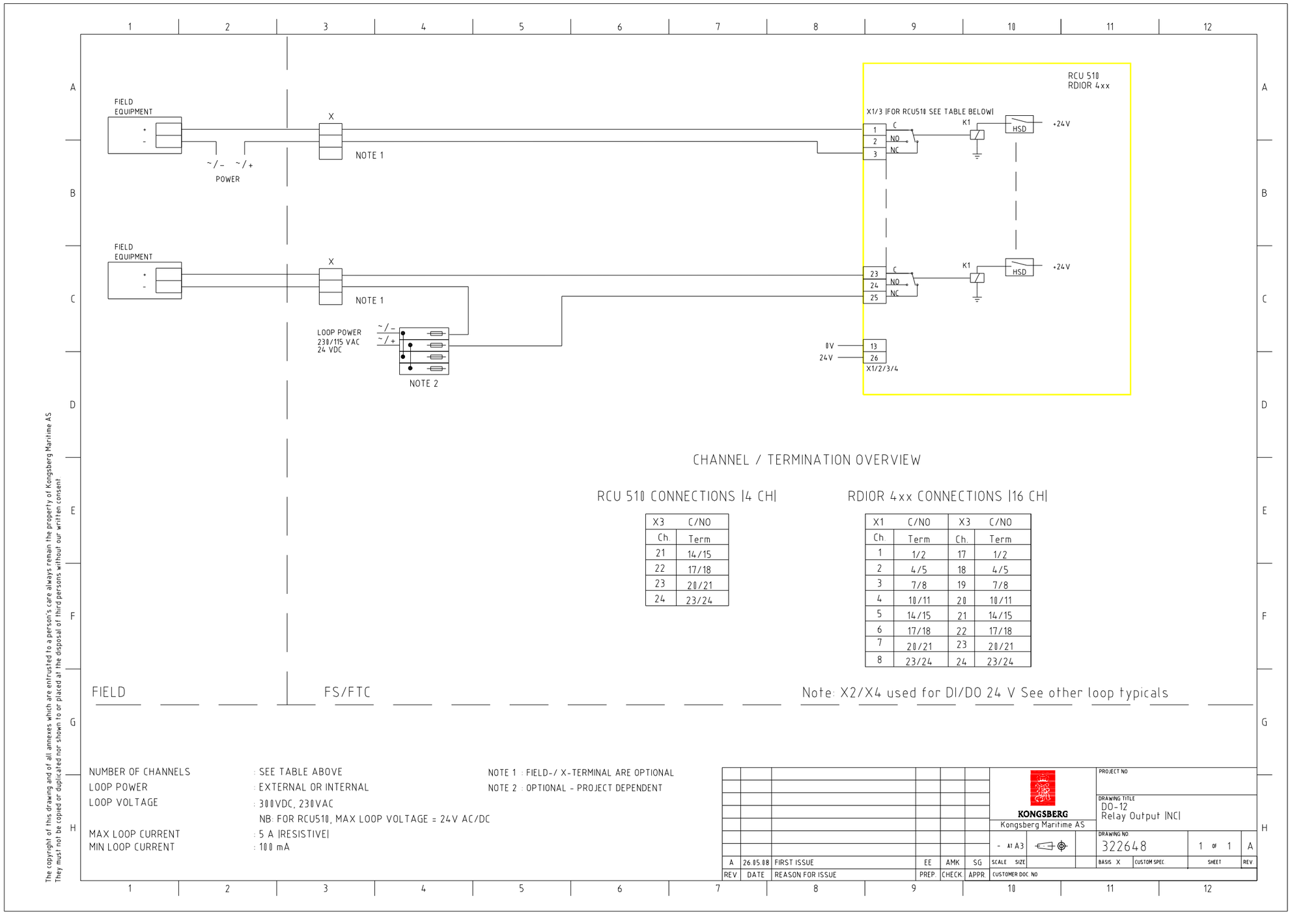
NUMBER OF CHANNELS : 8
LOOP POWER : INT/EXT

NOTE 1 : FIELD TERMINALS ARE OPTION
NOTE 2 : CURRENT LIMITING DEVICE IS REQUIRED, MAX 2A

REV	DATE	REASON FOR ISSUE	PREP.	CHECK.	APPR.
A	30.08.06	First issue	RN	SG	HAP

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: DO-11 IS1 DIGITAL RELAY OUTPUT
DRAWING NO. 307391
SCALE - AT A3 | SIZE | BASIS | CUSTOM SPEC. | SHEET 1 OF 1 | REV. A
DRAWING ID


FIELD EQUIPMENT
+
-
~/-
~/+
POWER
X
NOTE 1
FIELD EQUIPMENT
+
-
X
NOTE 1
LOOP POWER
230/115 VAC
24 VDC
~/-
~/+
NOTE 2
RCU 510
RDIOR 4xx
X1/3 IFOR RCU510 SEE TABLE BELOWI
1
2
3
C
NO
NC
K1
HSD
+24V
23
24
25
C
NO
NC
K1
HSD
+24V
0V
24V
13
26
X1/2/3/4
CHANNEL / TERMINATION OVERVIEW
RCU 510 CONNECTIONS I4 CHI
X3 C/NO
Ch. Term
21 14/15
22 17/18
23 20/21
24 23/24
RDIOR 4xx CONNECTIONS I16 CHI
X1 C/NO X3 C/NO
Ch. Term Ch. Term
1 1/2 17 1/2
2 4/5 18 4/5
3 7/8 19 7/8
4 10/11 20 10/11
5 14/15 21 14/15
6 17/18 22 17/18
7 20/21 23 20/21
8 23/24 24 23/24
FIELD
FS/FTC
Note: X2/X4 used for DI/DO 24 V See other loop typicals
NUMBER OF CHANNELS : SEE TABLE ABOVE
LOOP POWER : EXTERNAL OR INTERNAL
LOOP VOLTAGE : 300VDC, 230VAC
NB: FOR RCU510, MAX LOOP VOLTAGE = 24V AC/DC
MAX LOOP CURRENT : 5 A IRESISTIVEI
MIN LOOP CURRENT : 100 mA
NOTE 1 : FIELD-/ X-TERMINAL ARE OPTIONAL
NOTE 2 : OPTIONAL - PROJECT DEPENDENT
A 26.05.08 FIRST ISSUE EE AMK SG
REV DATE REASON FOR ISSUE PREP. CHECK APPR.
KONGSBERG
Kongsberg Maritime AS
PROJECT NO
DRAWING TITLE
DO-12
Relay Output INCI
DRAWING NO.
322648
1 OF 1
A
- AT A3
SCALE SIZE
BASIS X
CUSTOM SPEC.
SHEET
REV.
CUSTOMER DOC. NO
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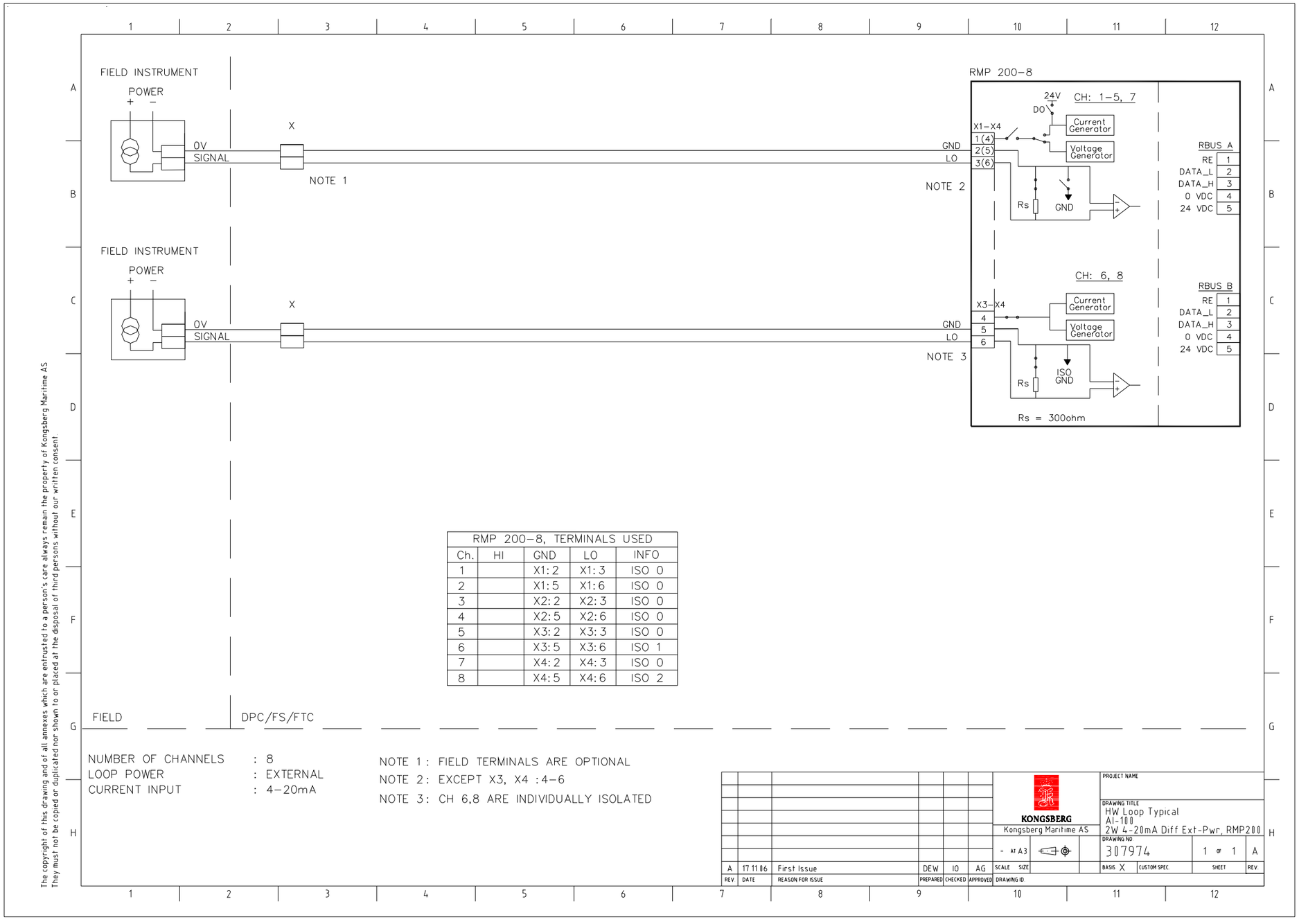
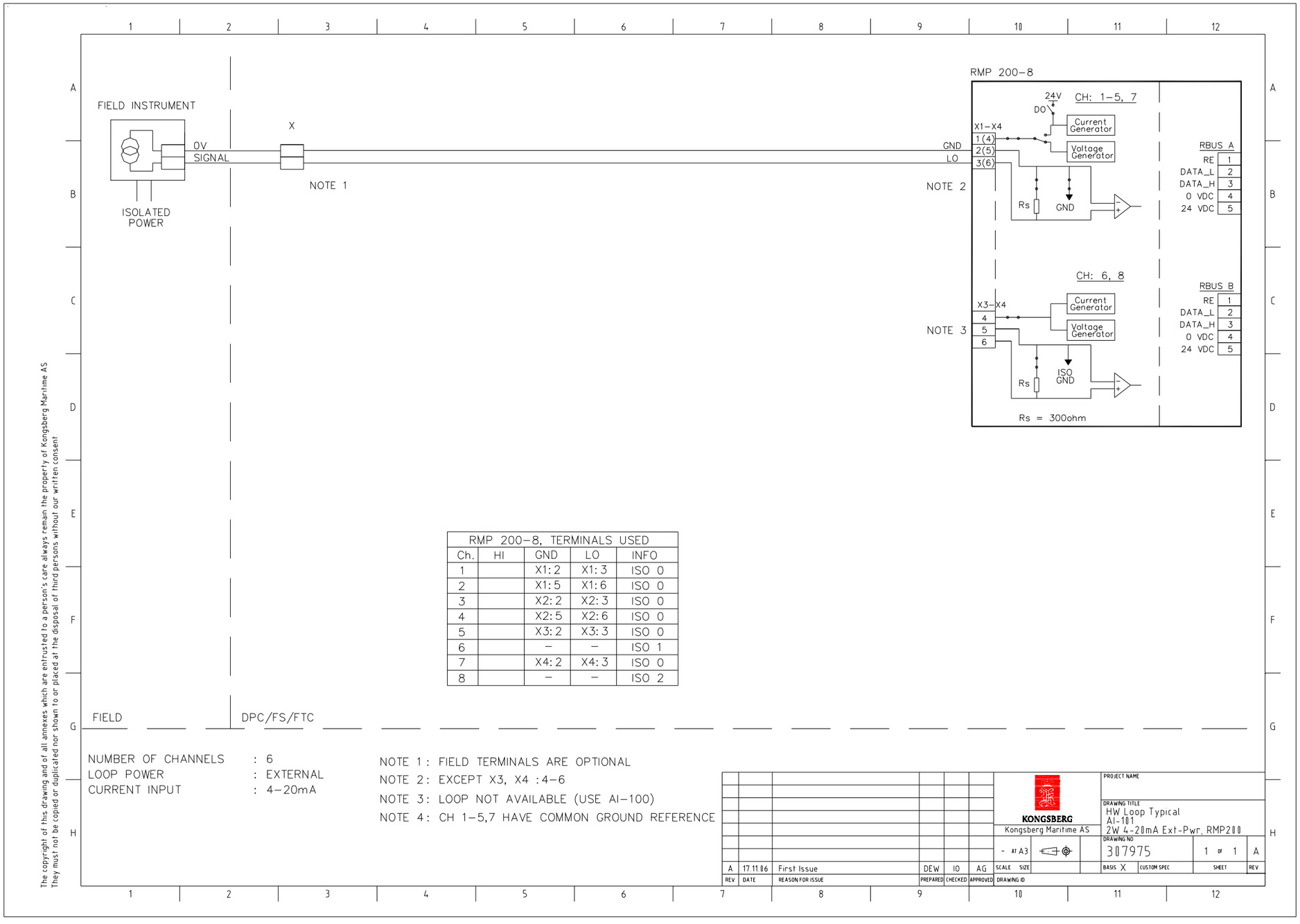


RMP 200–8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1		X1: 2	X1: 3	ISO 0
2		X1: 5	X1: 6	ISO 0
3		X2: 2	X2: 3	ISO 0
4		X2: 5	X2: 6	ISO 0
5		X3: 2	X3: 3	ISO 0
6		X3: 5	X3: 6	ISO 1
7		X4: 2	X4: 3	ISO 0
8		X4: 5	X4: 6	ISO 2



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1		X1: 2	X1: 3	ISO 0
2		X1: 5	X1: 6	ISO 0
3		X2: 2	X2: 3	ISO 0
4		X2: 5	X2: 6	ISO 0
5		X3: 2	X3: 3	ISO 0
6		–	–	ISO 1
7		X4: 2	X4: 3	ISO 0
8		–	–	ISO 2

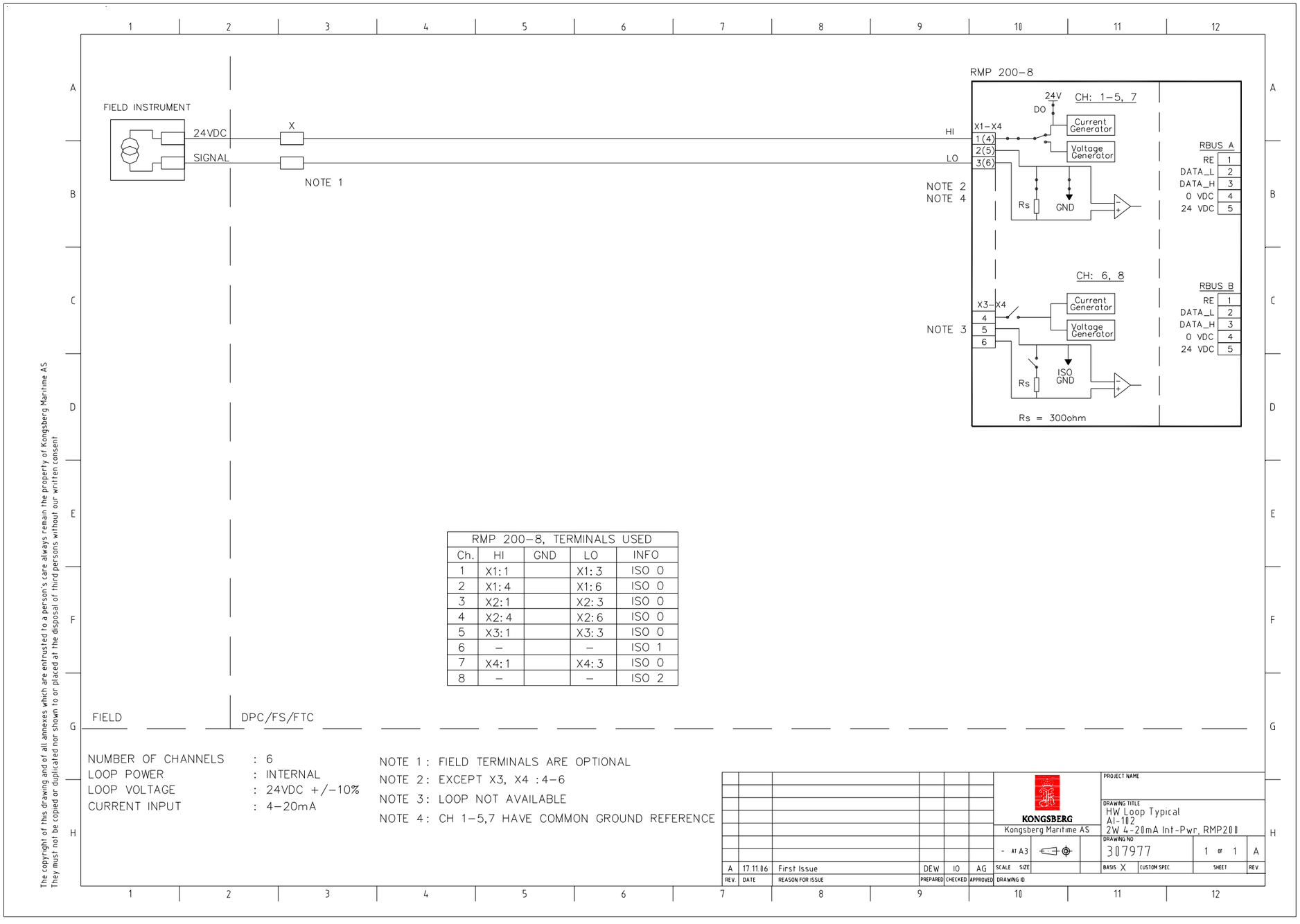
NUMBER OF CHANNELS : 6
LOOP POWER : EXTERNAL
CURRENT INPUT : 4–20mA

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4–6
NOTE 3: LOOP NOT AVAILABLE (USE AI–100)
NOTE 4: CH 1–5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-101 2W 4-20mA Ext-Pwr, RMP200
DRAWING NO. 307975
SCALE - AT A3 | SIZE A | BASIS X | CUSTOM SPEC | SHEET 1 OF 1 | REV A
DRAWING ID



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1:1		X1:3	ISO 0
2	X1:4		X1:6	ISO 0
3	X2:1		X2:3	ISO 0
4	X2:4		X2:6	ISO 0
5	X3:1		X3:3	ISO 0
6	–		–	ISO 1
7	X4:1		X4:3	ISO 0
8	–		–	ISO 2

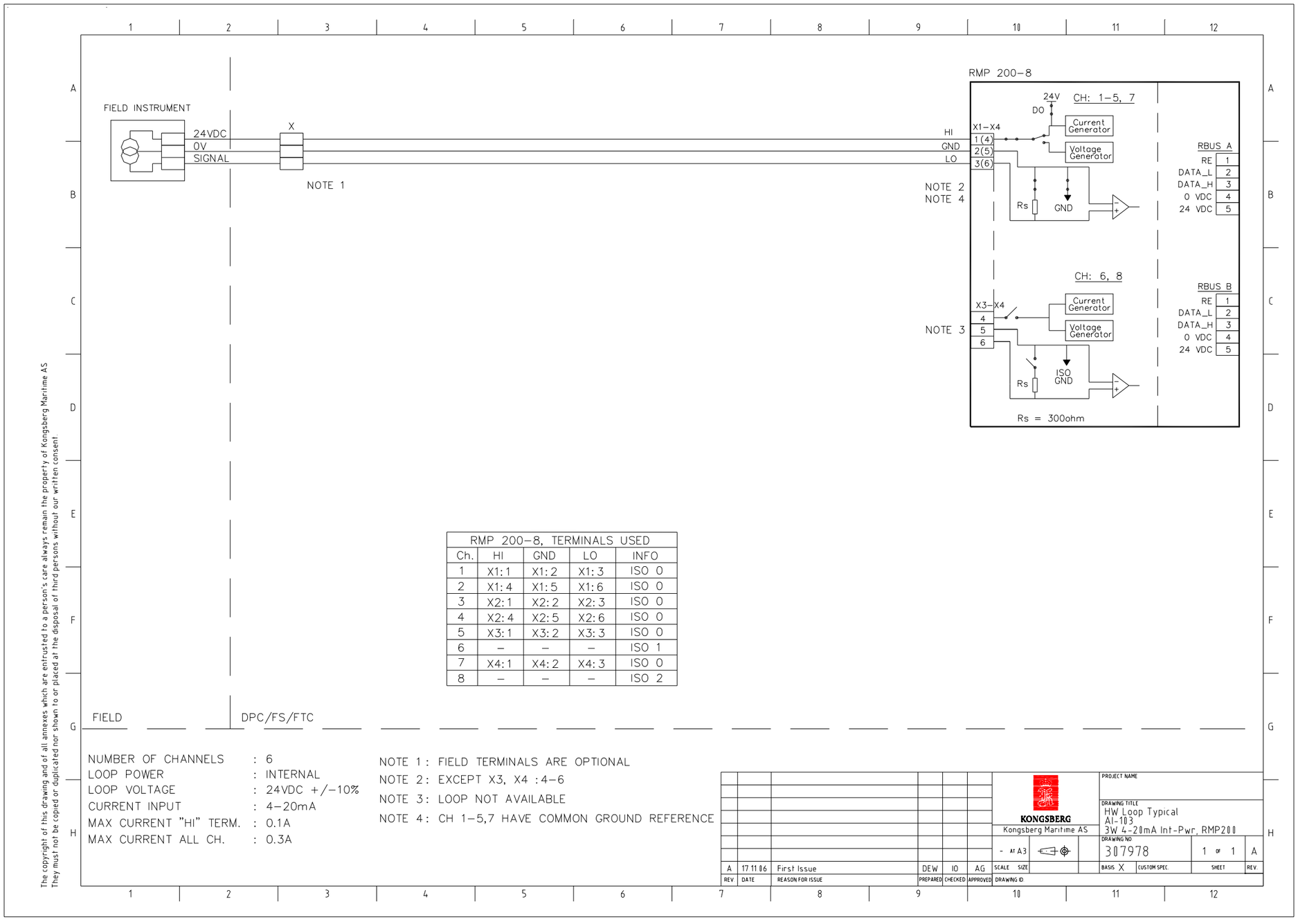
NUMBER OF CHANNELS : 6
LOOP POWER : INTERNAL
LOOP VOLTAGE : 24VDC +/-10%
CURRENT INPUT : 4-20mA

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4-6
NOTE 3: LOOP NOT AVAILABLE
NOTE 4: CH 1-5,7 HAVE COMMON GROUND REFERENCE

REV.	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-102 2W 4-20mA Int-Pwr, RMP200
DRAWING NO.: 307977
SCALE: - AT A3 | SIZE: A | BASIS: X | CUSTOM SPEC | SHEET: 1 OF 1 | REV.: A
DRAWING ID



RMP 200–8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1:1	X1:2	X1:3	ISO 0
2	X1:4	X1:5	X1:6	ISO 0
3	X2:1	X2:2	X2:3	ISO 0
4	X2:4	X2:5	X2:6	ISO 0
5	X3:1	X3:2	X3:3	ISO 0
6	–	–	–	ISO 1
7	X4:1	X4:2	X4:3	ISO 0
8	–	–	–	ISO 2

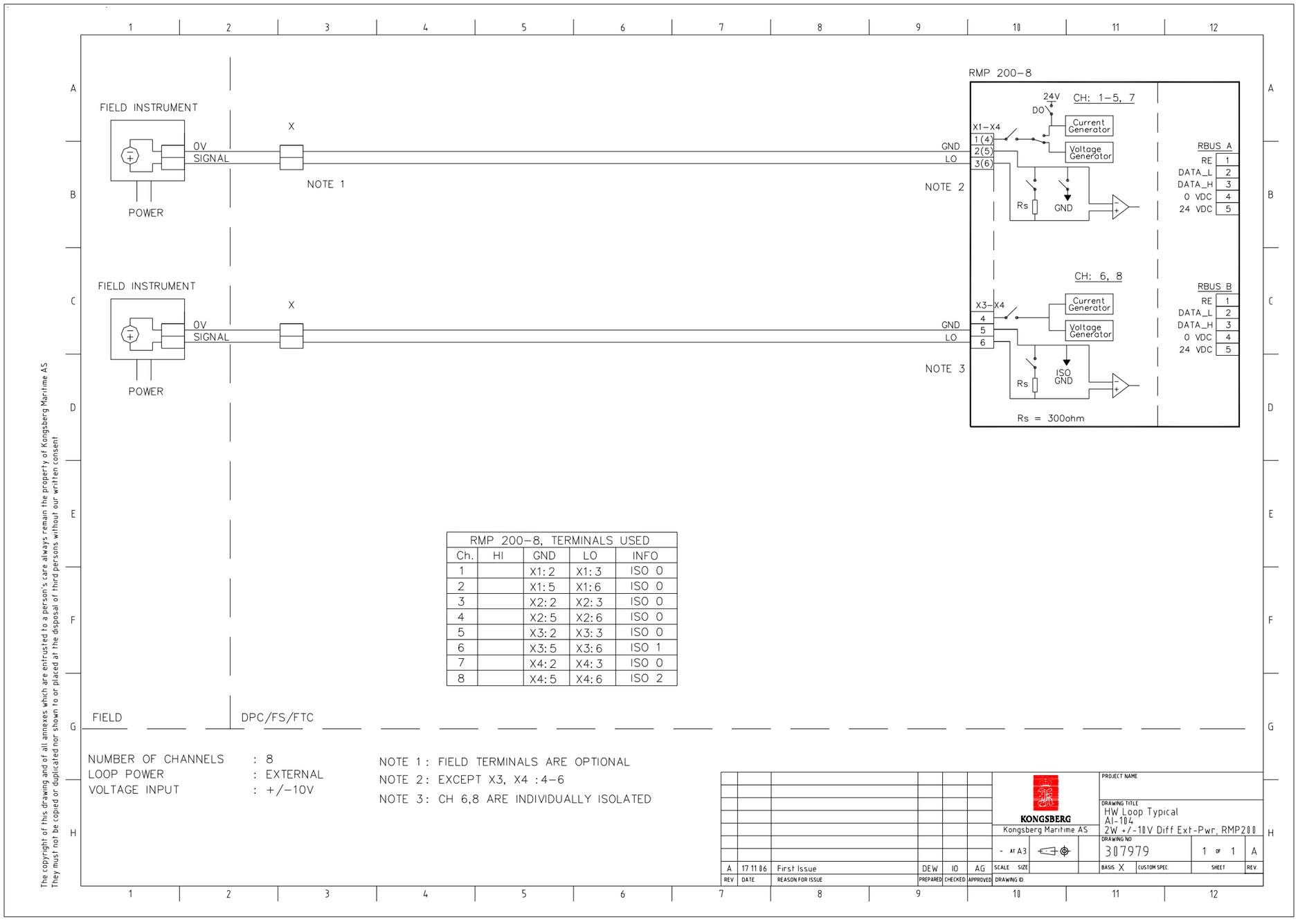
NUMBER OF CHANNELS : 6
LOOP POWER : INTERNAL
LOOP VOLTAGE : 24VDC +/–10%
CURRENT INPUT : 4–20mA
MAX CURRENT "HI" TERM. : 0.1A
MAX CURRENT ALL CH. : 0.3A

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4–6
NOTE 3: LOOP NOT AVAILABLE
NOTE 4: CH 1–5,7 HAVE COMMON GROUND REFERENCE

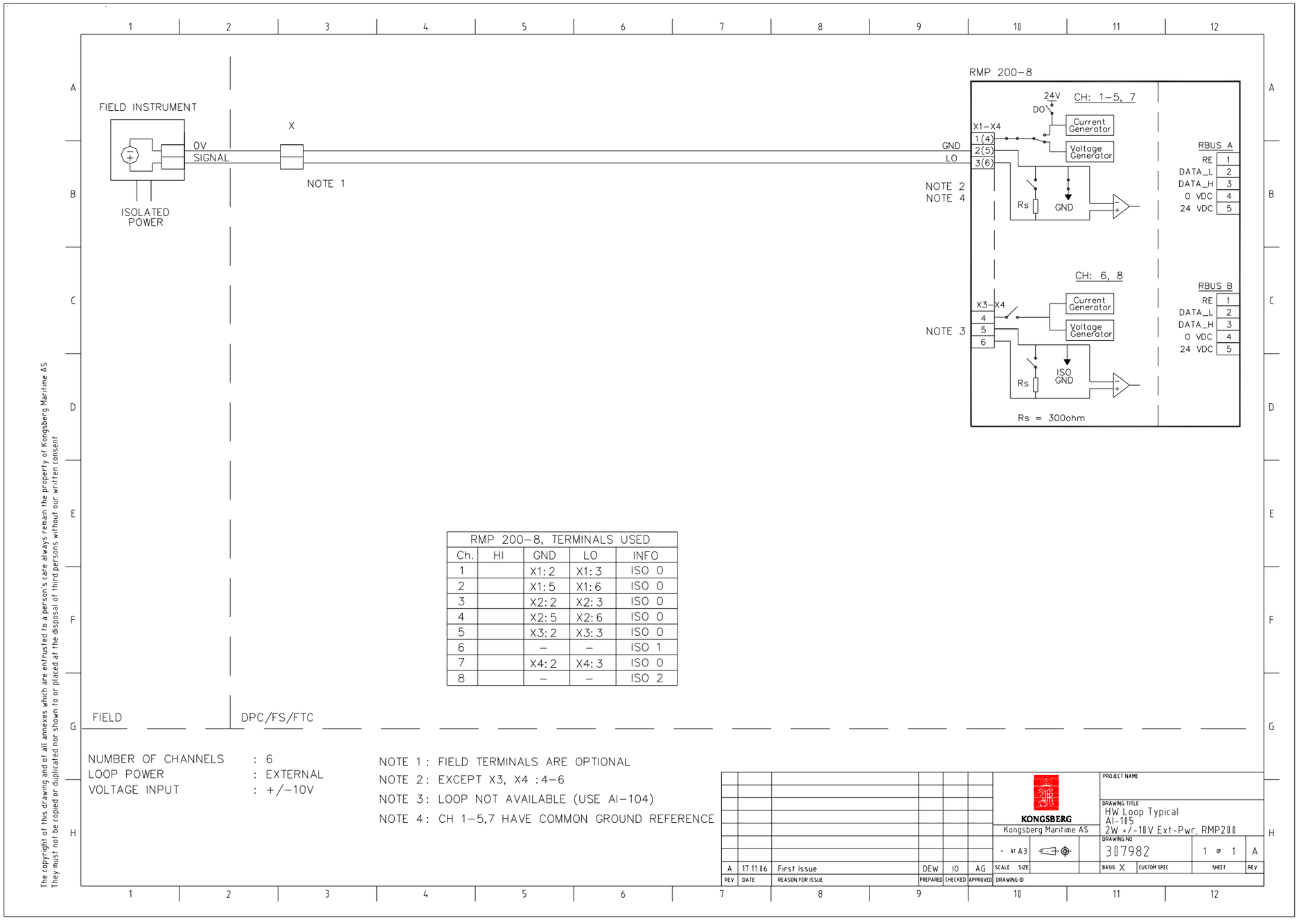
REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-103 3W 4-20mA Int-Pwr, RMP200
DRAWING NO: 307978
SCALE: - AT A3 | SIZE: A | BASIS: X | CUSTOM SPEC. | SHEET: 1 of 1 | REV: A
DRAWING ID



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1		X1: 2	X1: 3	ISO 0
2		X1: 5	X1: 6	ISO 0
3		X2: 2	X2: 3	ISO 0
4		X2: 5	X2: 6	ISO 0
5		X3: 2	X3: 3	ISO 0
6		X3: 5	X3: 6	ISO 1
7		X4: 2	X4: 3	ISO 0
8		X4: 5	X4: 6	ISO 2



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1		X1: 2	X1: 3	ISO 0
2		X1: 5	X1: 6	ISO 0
3		X2: 2	X2: 3	ISO 0
4		X2: 5	X2: 6	ISO 0
5		X3: 2	X3: 3	ISO 0
6		–	–	ISO 1
7		X4: 2	X4: 3	ISO 0
8		–	–	ISO 2

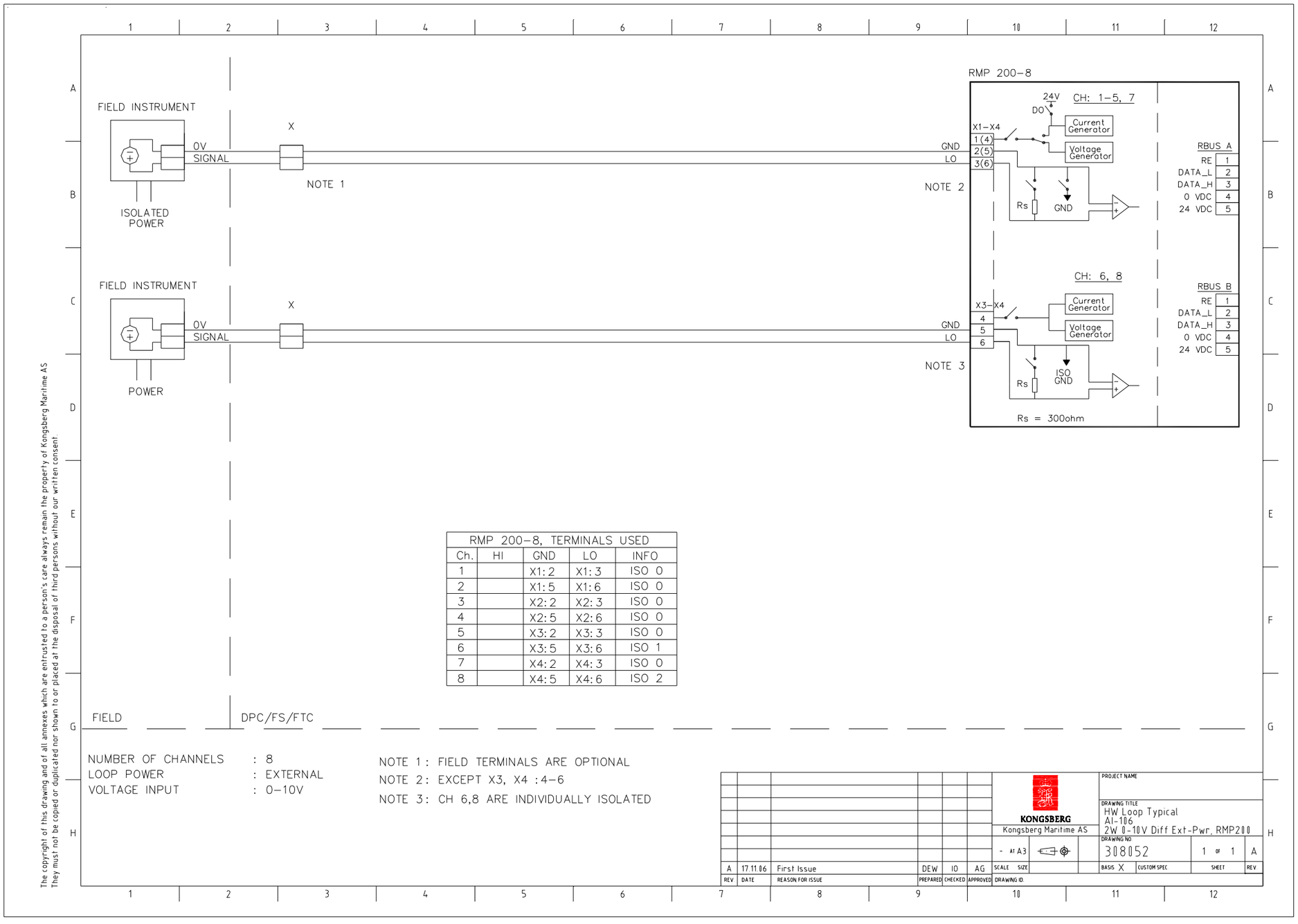
NUMBER OF CHANNELS : 6
LOOP POWER : EXTERNAL
VOLTAGE INPUT : +/-10V

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4-6
NOTE 3: LOOP NOT AVAILABLE (USE AI-104)
NOTE 4: CH 1-5,7 HAVE COMMON GROUND REFERENCE

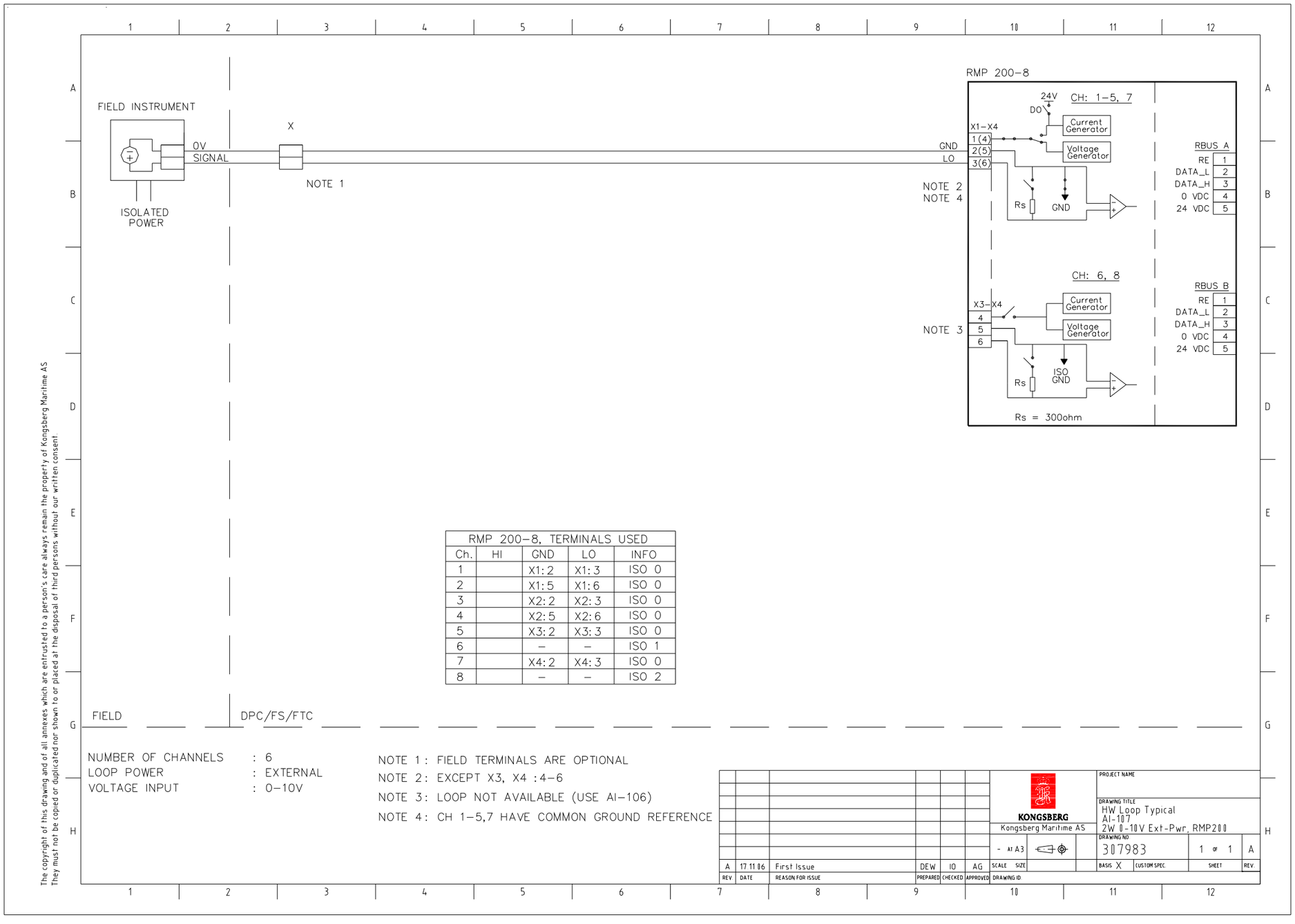
REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-105 2W +/-10V Ext-Pwr, RMP200
DRAWING NO: 307982
SCALE - AT A3 | SIZE A | BASIS X | CUSTOM SPEC | SHEET 1 of 1 | REV A
DRAWING ID



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1		X1: 2	X1: 3	ISO 0
2		X1: 5	X1: 6	ISO 0
3		X2: 2	X2: 3	ISO 0
4		X2: 5	X2: 6	ISO 0
5		X3: 2	X3: 3	ISO 0
6		X3: 5	X3: 6	ISO 1
7		X4: 2	X4: 3	ISO 0
8		X4: 5	X4: 6	ISO 2



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1		X1: 2	X1: 3	ISO 0
2		X1: 5	X1: 6	ISO 0
3		X2: 2	X2: 3	ISO 0
4		X2: 5	X2: 6	ISO 0
5		X3: 2	X3: 3	ISO 0
6		–	–	ISO 1
7		X4: 2	X4: 3	ISO 0
8		–	–	ISO 2

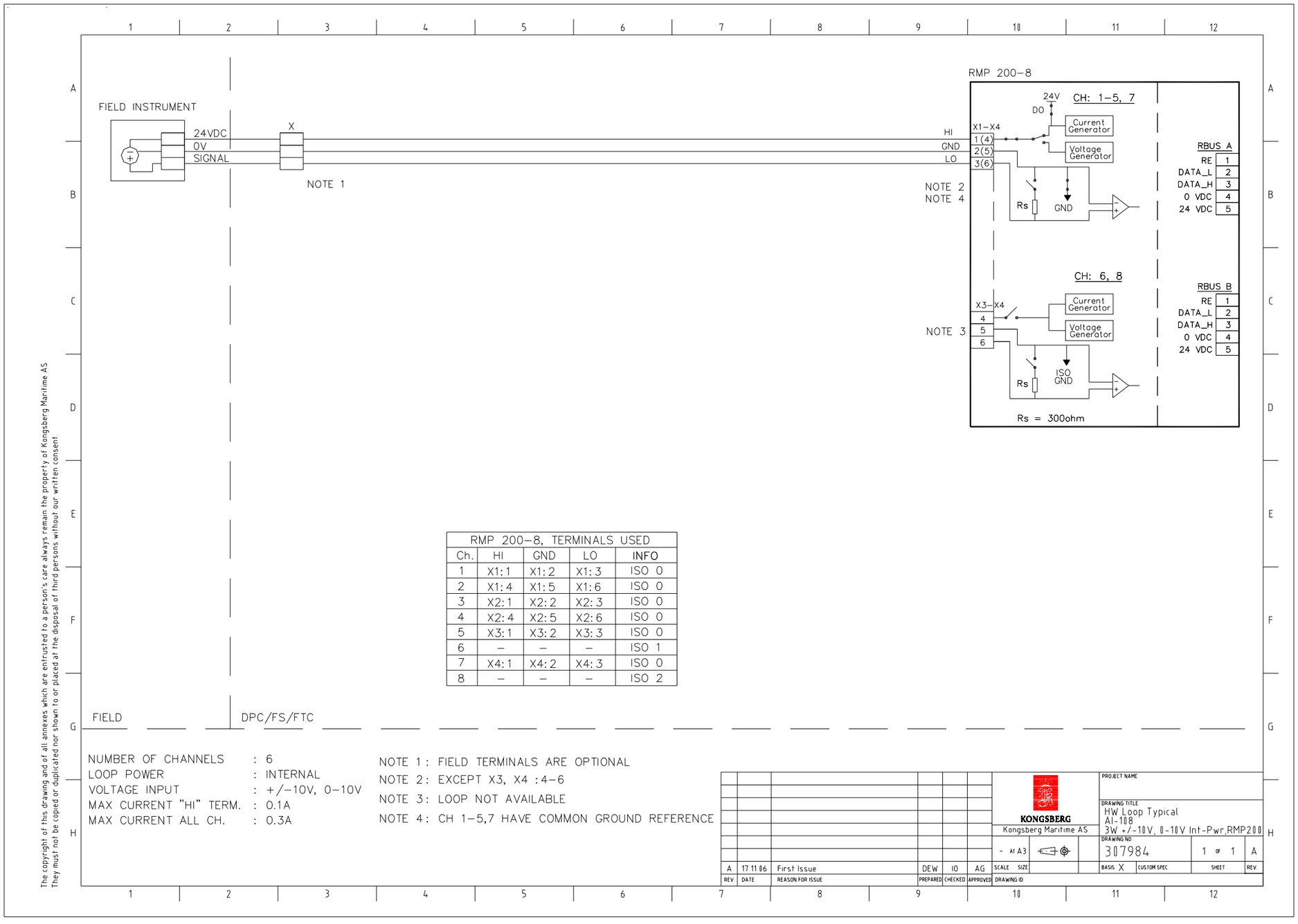
NUMBER OF CHANNELS : 6
LOOP POWER : EXTERNAL
VOLTAGE INPUT : 0–10V

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4–6
NOTE 3: LOOP NOT AVAILABLE (USE AI–106)
NOTE 4: CH 1–5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-107 2W 0-10V Ext-Pwr, RMP200
DRAWING NO: 307983
SCALE: - AT A3 | SIZE: A | BASIS: X | CUSTOM SPEC | SHEET: 1 of 1 | REV: A
DRAWING ID



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1:1	X1:2	X1:3	ISO 0
2	X1:4	X1:5	X1:6	ISO 0
3	X2:1	X2:2	X2:3	ISO 0
4	X2:4	X2:5	X2:6	ISO 0
5	X3:1	X3:2	X3:3	ISO 0
6	–	–	–	ISO 1
7	X4:1	X4:2	X4:3	ISO 0
8	–	–	–	ISO 2

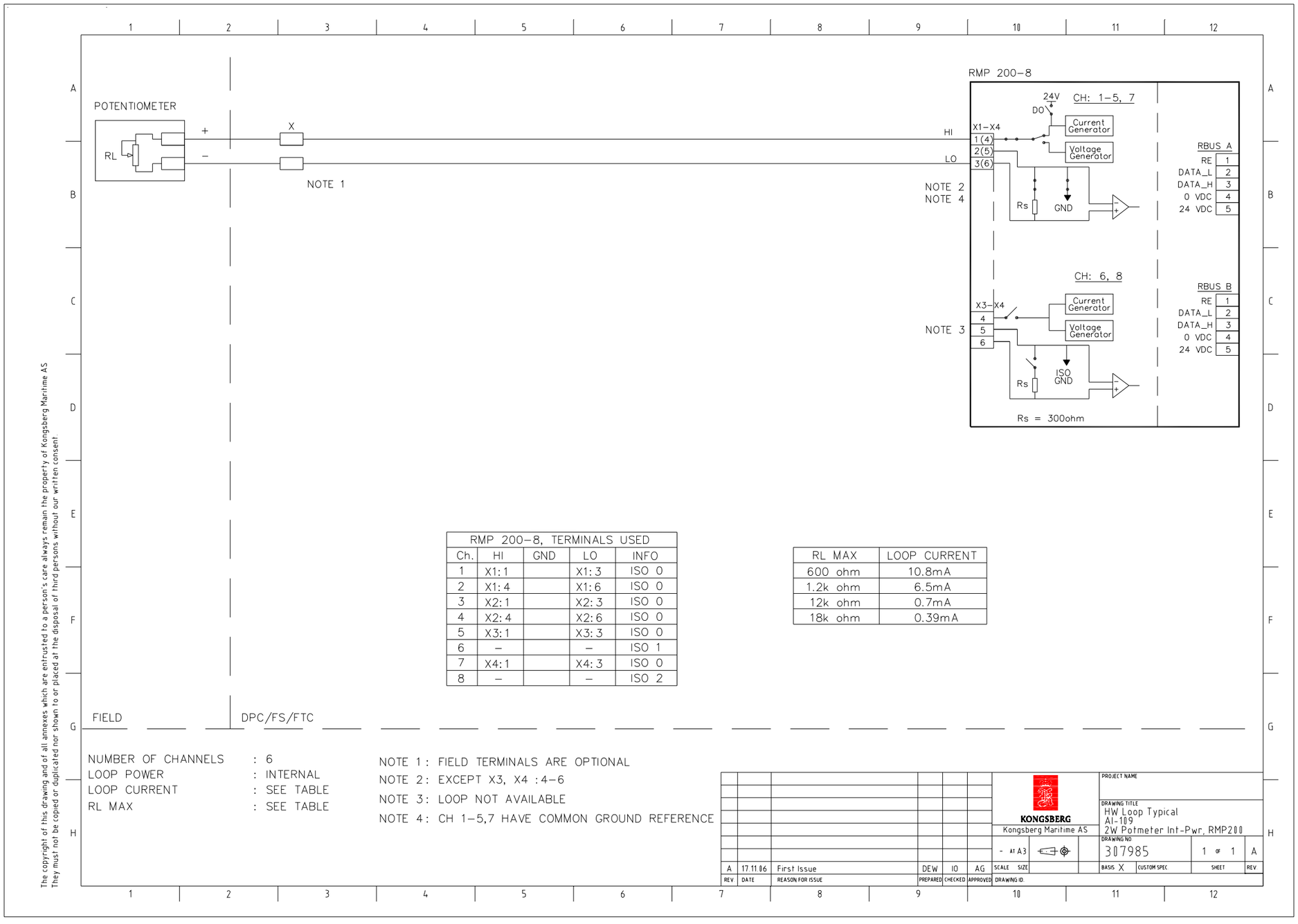
NUMBER OF CHANNELS : 6
LOOP POWER : INTERNAL
VOLTAGE INPUT : +/-10V, 0-10V
MAX CURRENT "HI" TERM. : 0.1A
MAX CURRENT ALL CH. : 0.3A

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4-6
NOTE 3: LOOP NOT AVAILABLE
NOTE 4: CH 1-5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-108 3W +/-10V, 0-10V Int-Pwr,RMP200
DRAWING NO: 307984
SCALE: - AT A3 | SIZE: A | SHEET: 1 of 1 | REV: A
BASIS: X | CUSTOM SPEC:
DRAWING ID:



RMP 200–8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1: 1		X1: 3	ISO 0
2	X1: 4		X1: 6	ISO 0
3	X2: 1		X2: 3	ISO 0
4	X2: 4		X2: 6	ISO 0
5	X3: 1		X3: 3	ISO 0
6	–		–	ISO 1
7	X4: 1		X4: 3	ISO 0
8	–		–	ISO 2

RL MAX	LOOP CURRENT
600 ohm	10.8mA
1.2k ohm	6.5mA
12k ohm	0.7mA
18k ohm	0.39mA

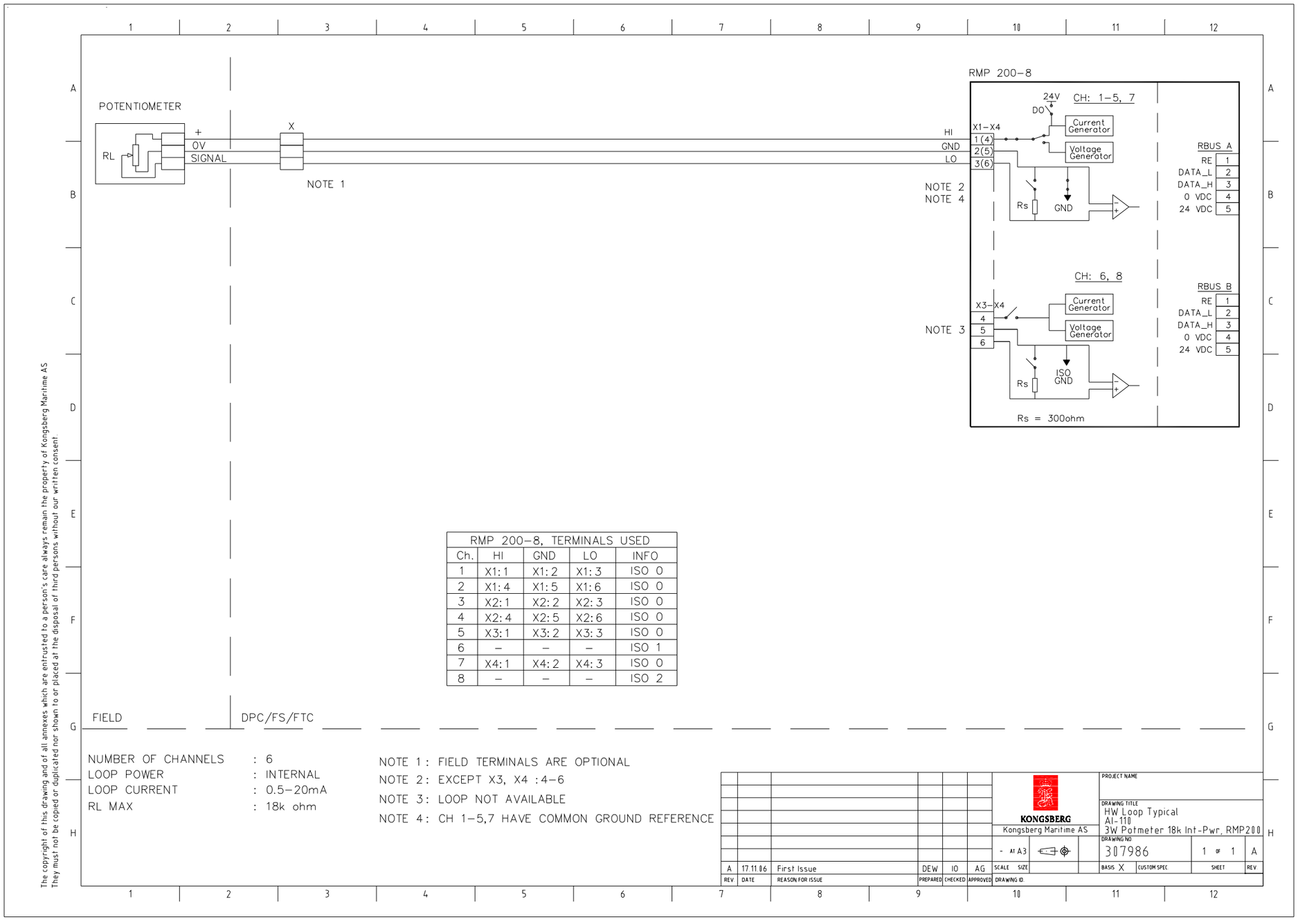
NUMBER OF CHANNELS : 6
LOOP POWER : INTERNAL
LOOP CURRENT : SEE TABLE
RL MAX : SEE TABLE

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4–6
NOTE 3: LOOP NOT AVAILABLE
NOTE 4: CH 1–5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-109 2W Potmeter Int-Pwr, RMP200
DRAWING NO: 307985
SCALE: - AT A3 | SIZE: A | BASIS: X | CUSTOM SPEC | SHEET: 1 of 1 | REV: A
DRAWING ID.



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1: 1	X1: 2	X1: 3	ISO 0
2	X1: 4	X1: 5	X1: 6	ISO 0
3	X2: 1	X2: 2	X2: 3	ISO 0
4	X2: 4	X2: 5	X2: 6	ISO 0
5	X3: 1	X3: 2	X3: 3	ISO 0
6	–	–	–	ISO 1
7	X4: 1	X4: 2	X4: 3	ISO 0
8	–	–	–	ISO 2

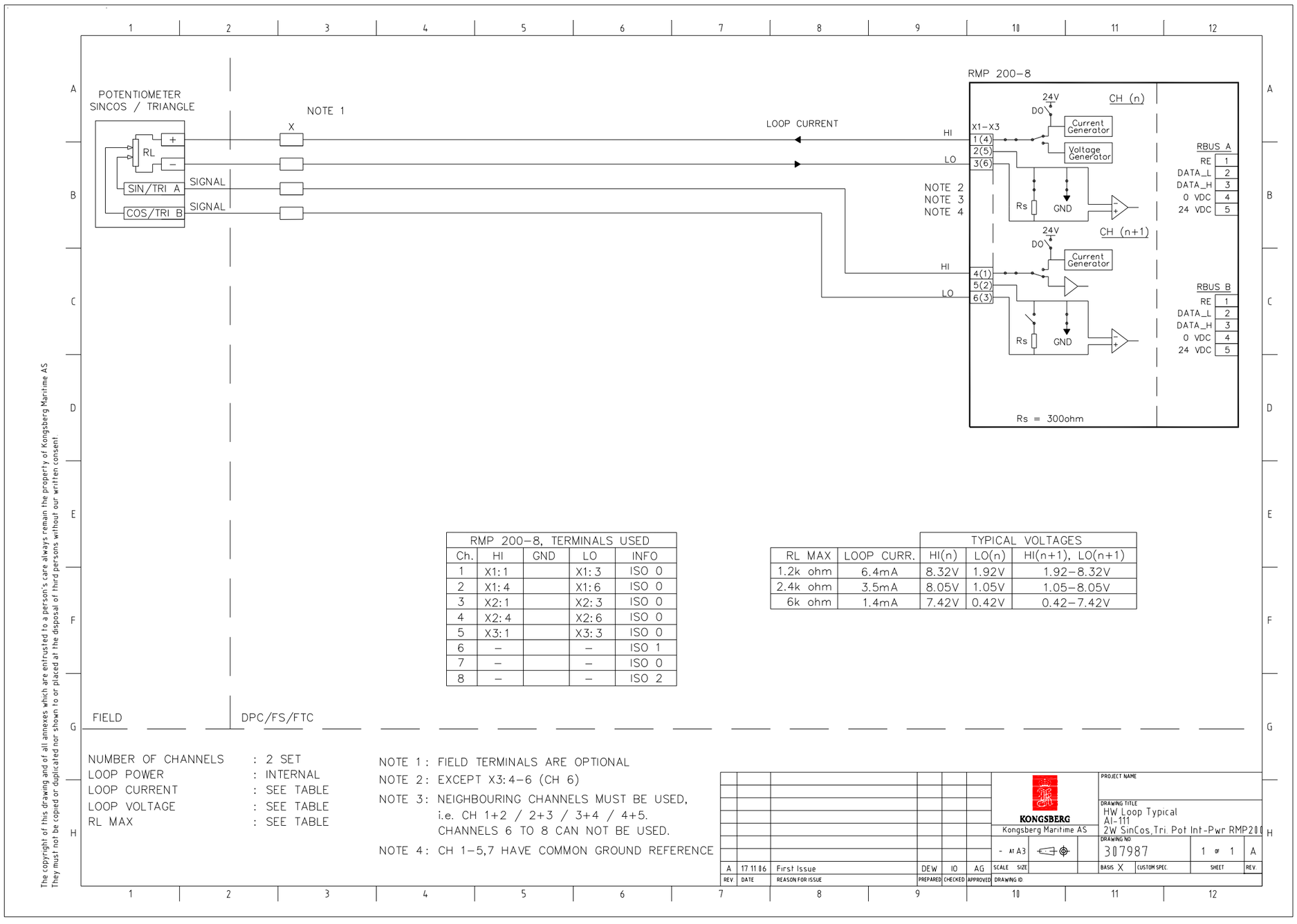
NUMBER OF CHANNELS : 6
LOOP POWER : INTERNAL
LOOP CURRENT : 0.5–20mA
RL MAX : 18k ohm

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4–6
NOTE 3: LOOP NOT AVAILABLE
NOTE 4: CH 1–5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AI-110 3W Potmeter 18k Int-Pwr, RMP200
DRAWING NO: 307986
SCALE: - AT A3 | SIZE: A | SHEET: 1 of 1 | REV: A
BASIS: X | CUSTOM SPEC:
DRAWING ID:



RMP 200–8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1: 1		X1: 3	ISO 0
2	X1: 4		X1: 6	ISO 0
3	X2: 1		X2: 3	ISO 0
4	X2: 4		X2: 6	ISO 0
5	X3: 1		X3: 3	ISO 0
6	–		–	ISO 1
7	–		–	ISO 0
8	–		–	ISO 2

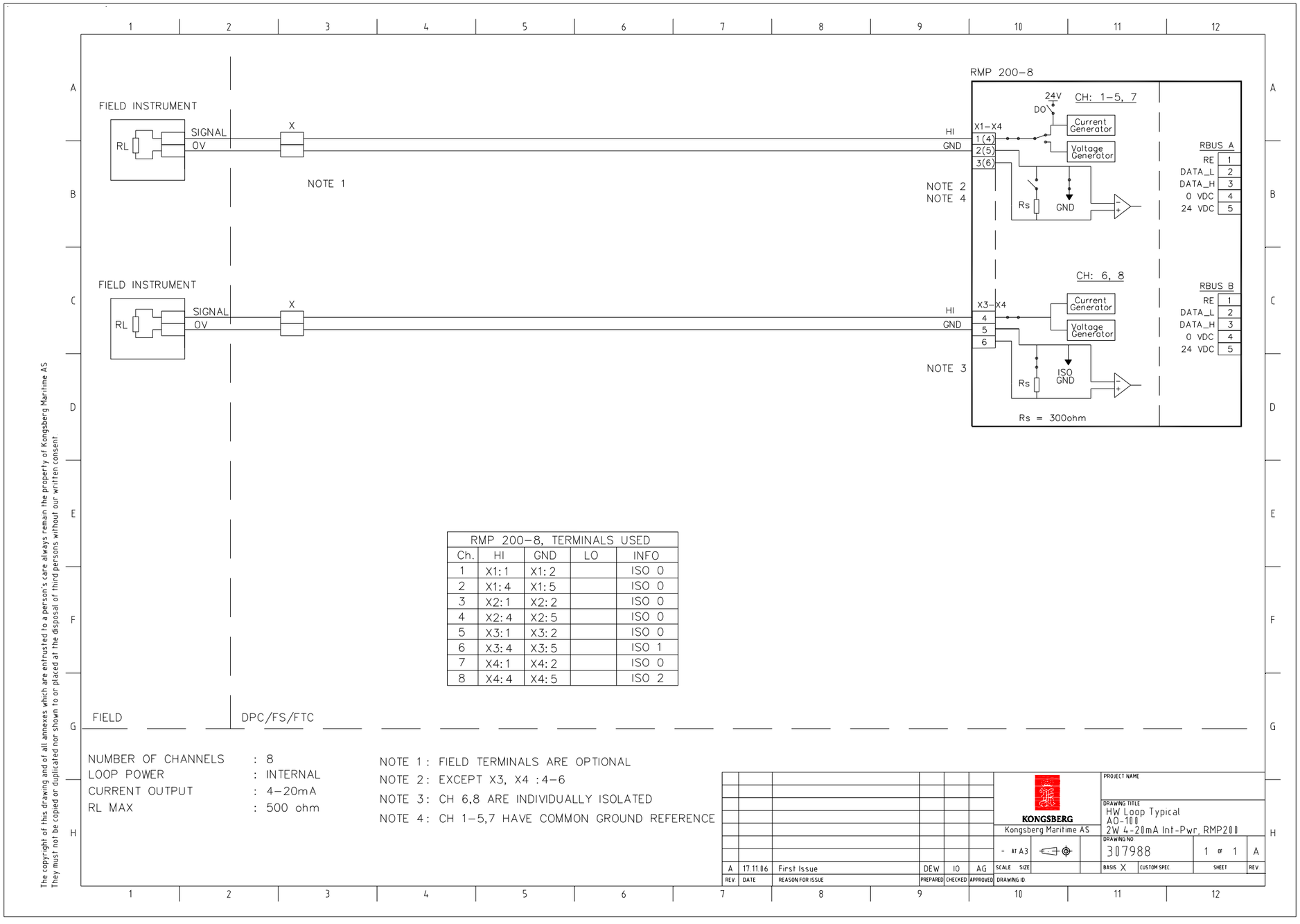
		TYPICAL VOLTAGES		
RL MAX	LOOP CURR.	HI(n)	LO(n)	HI(n+1), LO(n+1)
1.2k ohm	6.4mA	8.32V	1.92V	1.92–8.32V
2.4k ohm	3.5mA	8.05V	1.05V	1.05–8.05V
6k ohm	1.4mA	7.42V	0.42V	0.42–7.42V

NUMBER OF CHANNELS : 2 SET
LOOP POWER : INTERNAL
LOOP CURRENT : SEE TABLE
LOOP VOLTAGE : SEE TABLE
RL MAX : SEE TABLE

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3: 4–6 (CH 6)
NOTE 3: NEIGHBOURING CHANNELS MUST BE USED, i.e. CH 1+2 / 2+3 / 3+4 / 4+5. CHANNELS 6 TO 8 CAN NOT BE USED.
NOTE 4: CH 1–5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
HW Loop Typical
AI-111
2W SinCos,Tri. Pot Int-Pwr RMP200
DRAWING NO. 307987
SCALE - AT A3
SIZE
BASIS X
CUSTOM SPEC.
SHEET 1 of 1
REV. A
DRAWING ID



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1: 1	X1: 2		ISO 0
2	X1: 4	X1: 5		ISO 0
3	X2: 1	X2: 2		ISO 0
4	X2: 4	X2: 5		ISO 0
5	X3: 1	X3: 2		ISO 0
6	X3: 4	X3: 5		ISO 1
7	X4: 1	X4: 2		ISO 0
8	X4: 4	X4: 5		ISO 2

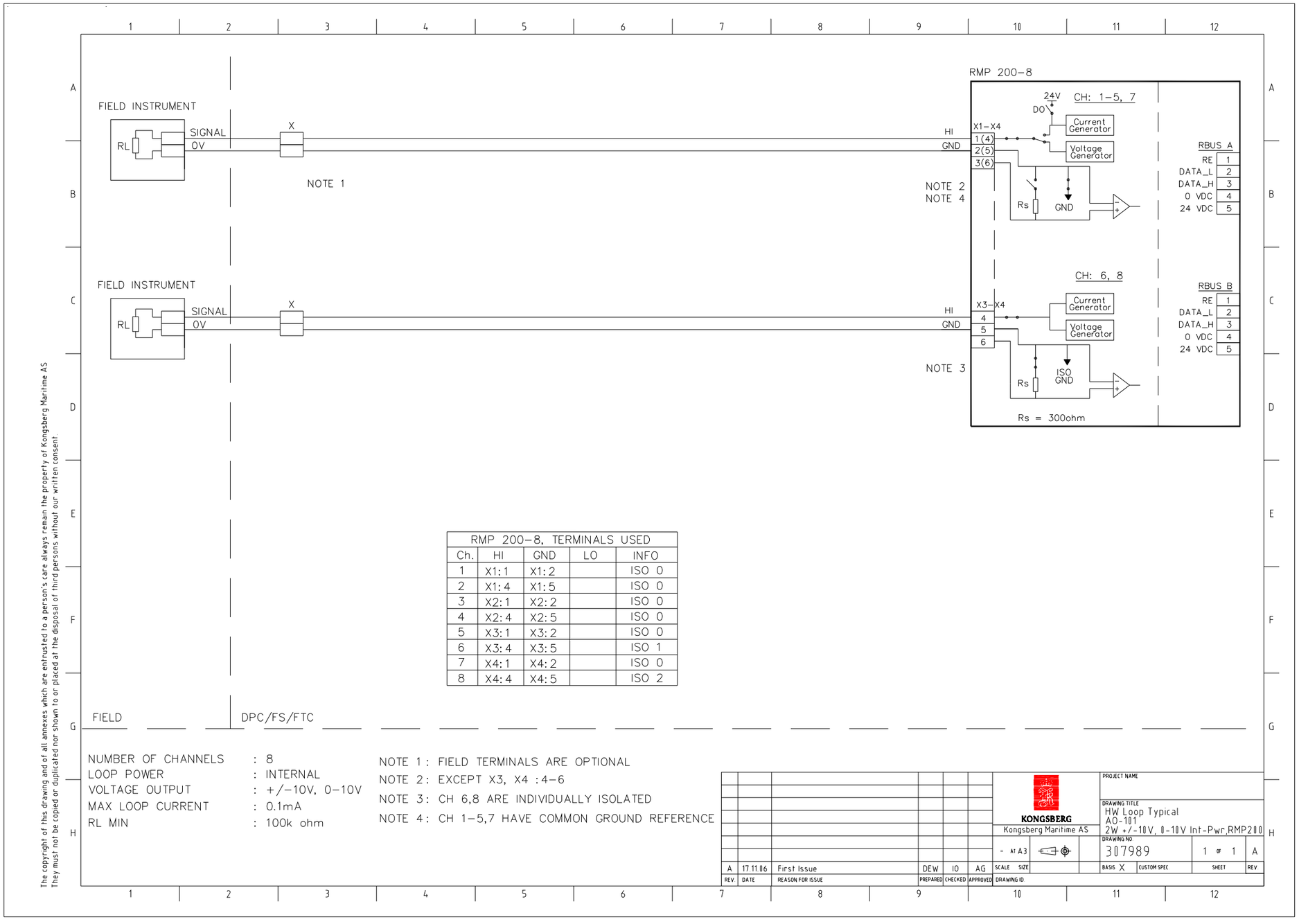
NUMBER OF CHANNELS : 8
LOOP POWER : INTERNAL
CURRENT OUTPUT : 4-20mA
RL MAX : 500 ohm

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4-6
NOTE 3: CH 6,8 ARE INDIVIDUALLY ISOLATED
NOTE 4: CH 1-5,7 HAVE COMMON GROUND REFERENCE

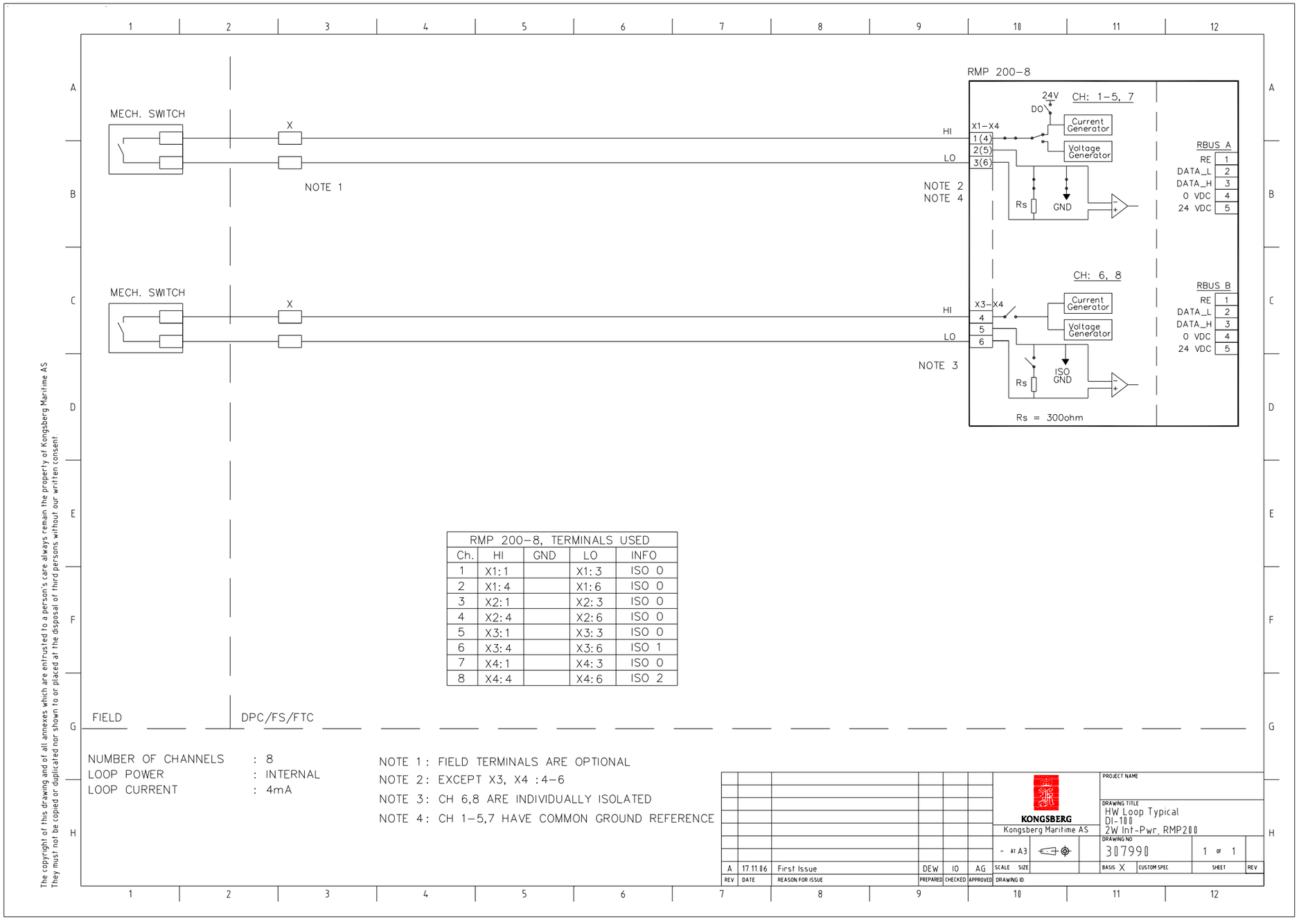
REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical AO-100 2W 4-20mA Int-Pwr, RMP200
DRAWING NO. 307988
SCALE - AT A3 | SIZE A | BASIS X | CUSTOM SPEC | SHEET 1 OF 1 | REV A
DRAWING ID



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1:1	X1:2		ISO 0
2	X1:4	X1:5		ISO 0
3	X2:1	X2:2		ISO 0
4	X2:4	X2:5		ISO 0
5	X3:1	X3:2		ISO 0
6	X3:4	X3:5		ISO 1
7	X4:1	X4:2		ISO 0
8	X4:4	X4:5		ISO 2



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1: 1		X1: 3	ISO 0
2	X1: 4		X1: 6	ISO 0
3	X2: 1		X2: 3	ISO 0
4	X2: 4		X2: 6	ISO 0
5	X3: 1		X3: 3	ISO 0
6	X3: 4		X3: 6	ISO 1
7	X4: 1		X4: 3	ISO 0
8	X4: 4		X4: 6	ISO 2

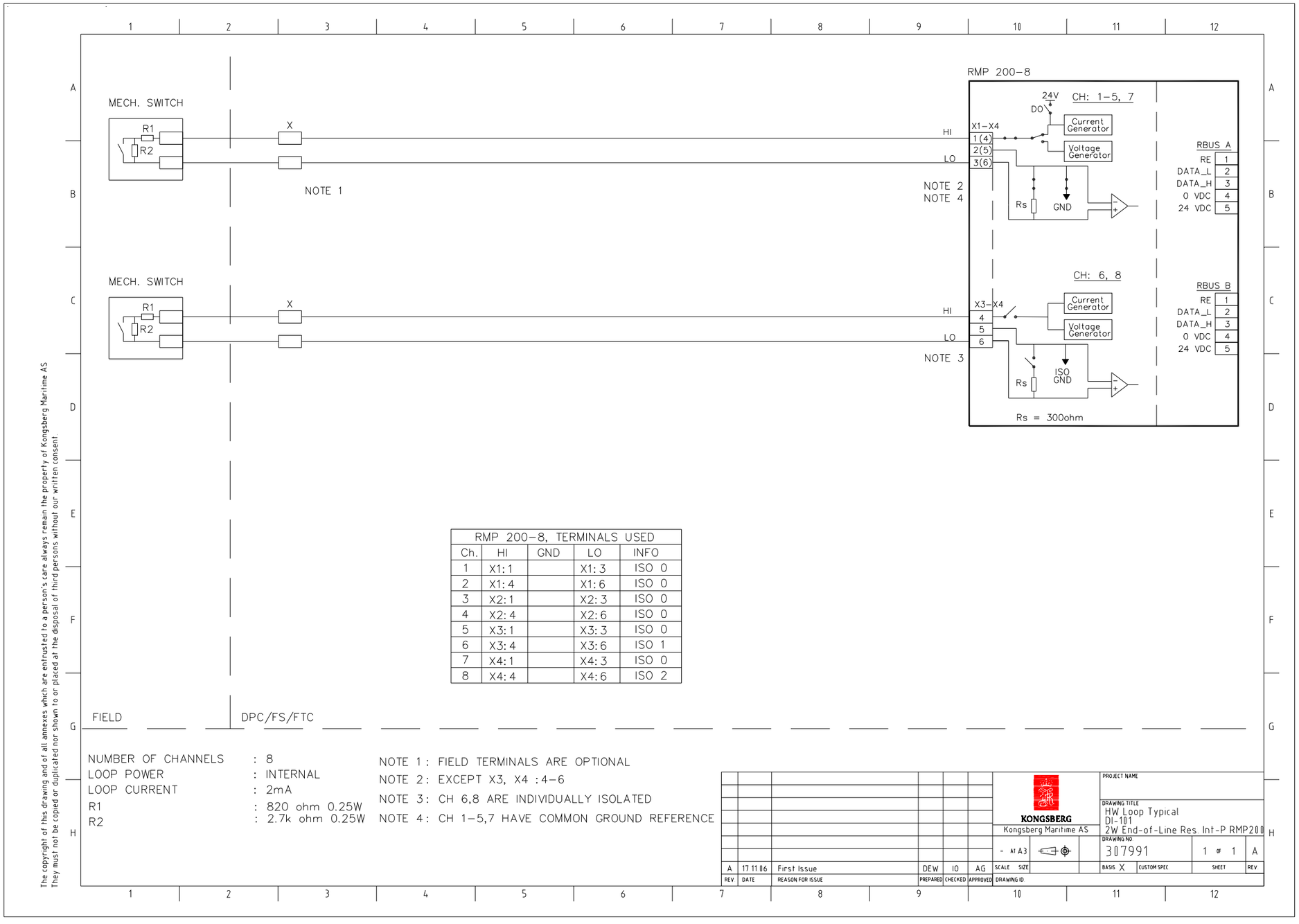
NUMBER OF CHANNELS : 8
LOOP POWER : INTERNAL
LOOP CURRENT : 4mA

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4-6
NOTE 3: CH 6,8 ARE INDIVIDUALLY ISOLATED
NOTE 4: CH 1-5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical DI-100 2W Int-Pwr, RMP200
DRAWING NO: 307990
SCALE: - AT A3 | SIZE | BASIS X | CUSTOM SPEC | SHEET: 1 of 1 | REV



RMP 200-8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1: 1		X1: 3	ISO 0
2	X1: 4		X1: 6	ISO 0
3	X2: 1		X2: 3	ISO 0
4	X2: 4		X2: 6	ISO 0
5	X3: 1		X3: 3	ISO 0
6	X3: 4		X3: 6	ISO 1
7	X4: 1		X4: 3	ISO 0
8	X4: 4		X4: 6	ISO 2

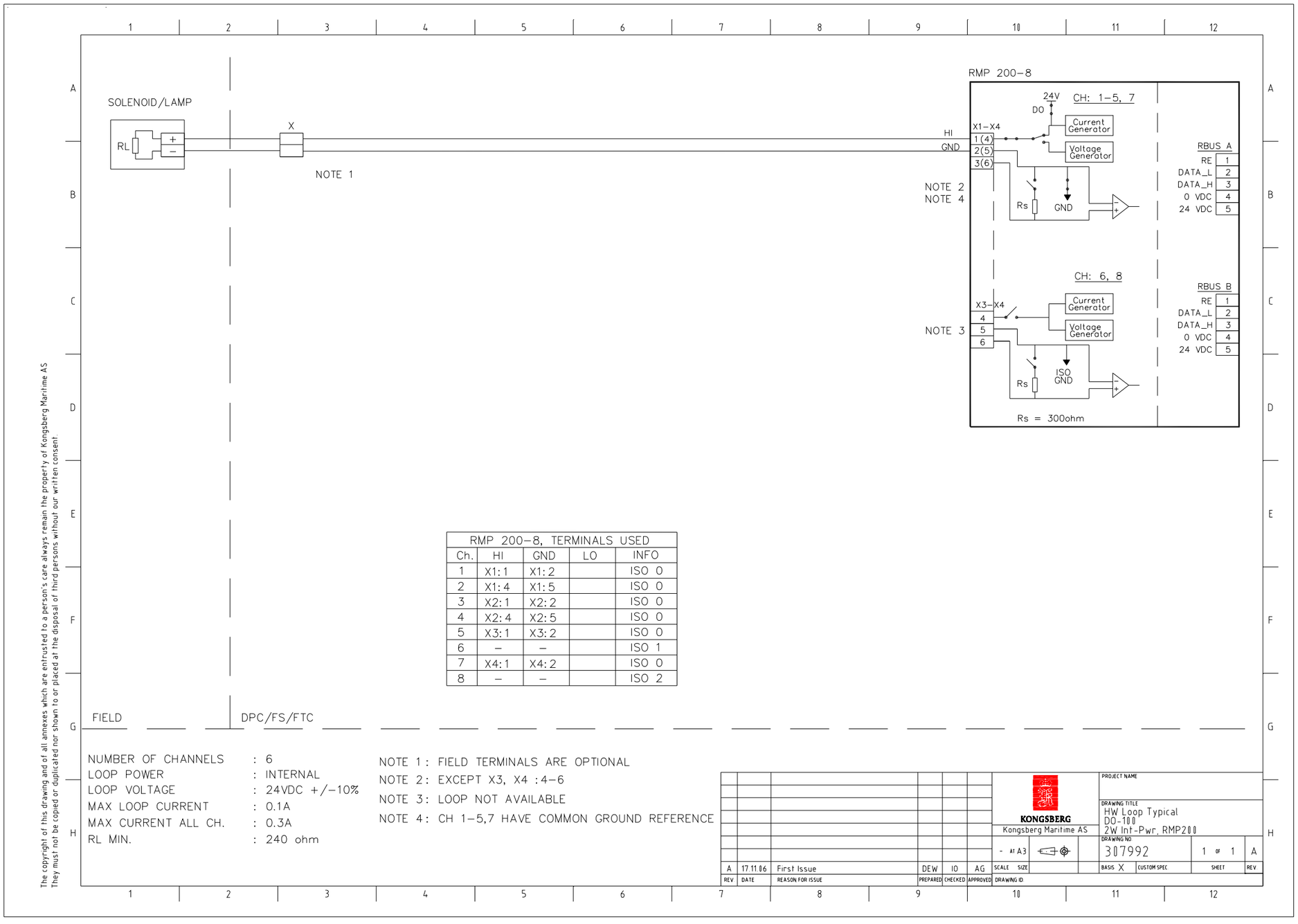
NUMBER OF CHANNELS : 8
LOOP POWER : INTERNAL
LOOP CURRENT : 2mA
R1 : 820 ohm 0.25W
R2 : 2.7k ohm 0.25W

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4-6
NOTE 3: CH 6,8 ARE INDIVIDUALLY ISOLATED
NOTE 4: CH 1-5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical DI-101 2W End-of-Line Res. Int-P RMP200
DRAWING NO: 307991 | SHEET: 1 of 1 | REV: A
SCALE: - AT A3 | SIZE | BASIS: X | CUSTOM SPEC
DRAWING ID:



RMP 200–8, TERMINALS USED				
Ch.	HI	GND	LO	INFO
1	X1:1	X1:2		ISO 0
2	X1:4	X1:5		ISO 0
3	X2:1	X2:2		ISO 0
4	X2:4	X2:5		ISO 0
5	X3:1	X3:2		ISO 0
6	–	–		ISO 1
7	X4:1	X4:2		ISO 0
8	–	–		ISO 2

NUMBER OF CHANNELS : 6
LOOP POWER : INTERNAL
LOOP VOLTAGE : 24VDC +/–10%
MAX LOOP CURRENT : 0.1A
MAX CURRENT ALL CH. : 0.3A
RL MIN. : 240 ohm

NOTE 1: FIELD TERMINALS ARE OPTIONAL
NOTE 2: EXCEPT X3, X4 :4–6
NOTE 3: LOOP NOT AVAILABLE
NOTE 4: CH 1–5,7 HAVE COMMON GROUND REFERENCE

REV	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
A	17.11.06	First Issue	DEW	IO	AG

KONGSBERG
Kongsberg Maritime AS

PROJECT NAME
DRAWING TITLE: HW Loop Typical DO-100 2W Int-Pwr, RMP200
DRAWING NO: 307992
SCALE: - AT A3 | SIZE: A | SHEET: 1 of 1 | REV: A
BASIS X | CUSTOM SPEC
DRAWING ID

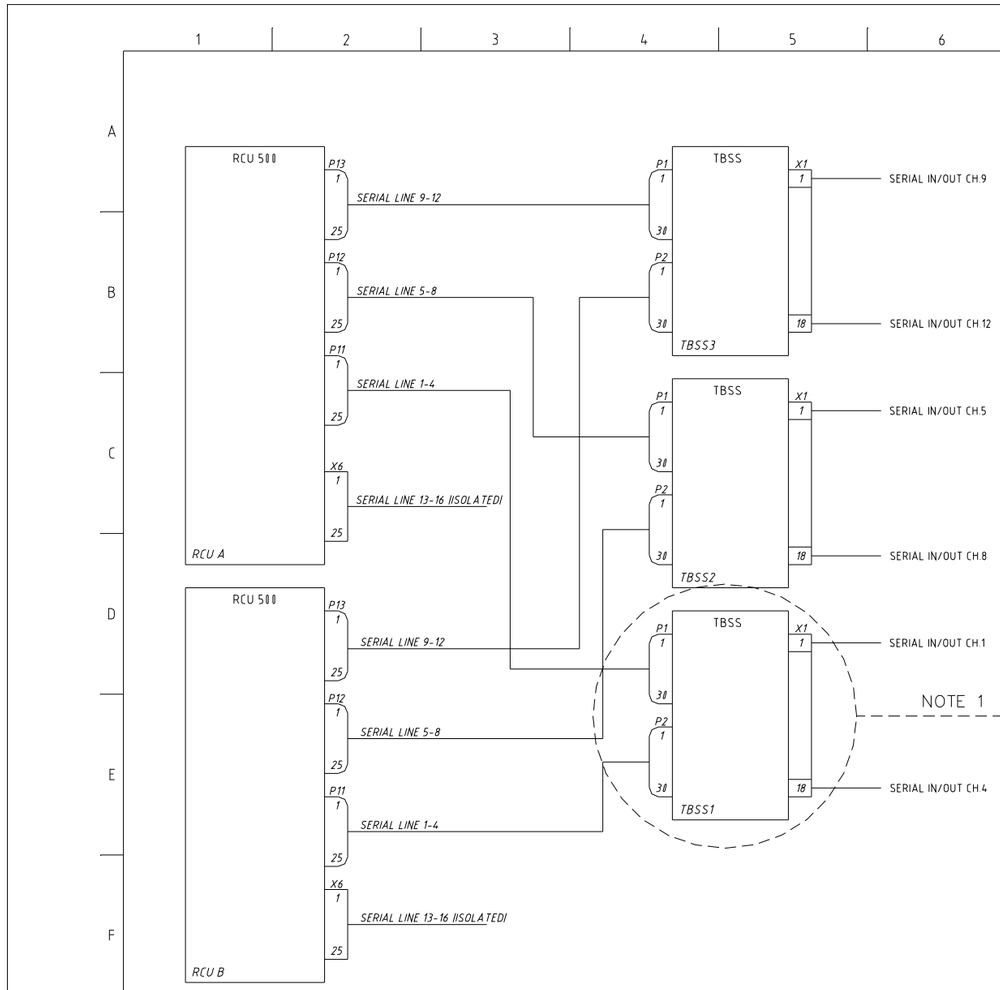
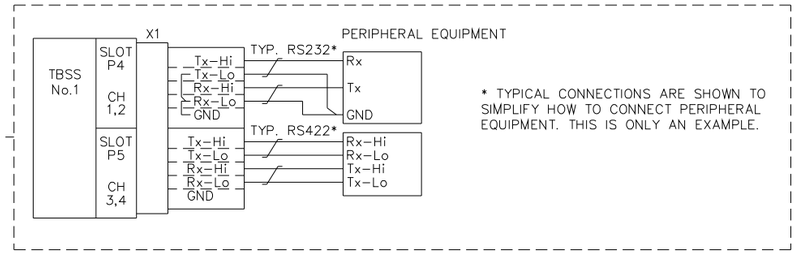


TABLE 1
SERIAL LINE INTERFACE TO TBSS (TERMINATION BOARD SERIAL LINE)

SYSTEM	TBSS LOC.	TBSS	RECEIVE			TRANSMIT	
CHANNEL		SLOT NO.	SIGNAL	COMMON	GND	SIGNAL	COMMON
			(RX-HI)/X1	(RX-LO)/X1	(TX/RX)	(TX-HI)/X1	(TX-LO)/X1
1(B)	1	P4	6	7	1	8	9
2(C)	1	P4	2	3	1	4	5
3(D)	1	P5	15	16	10	17	18
4(E)	1	P5	11	12	10	13	14
5(F)	2	P4	6	7	1	8	9
6(G)	2	P4	2	3	1	4	5
7(H)	2	P5	15	16	10	17	18
8(I)	2	P5	11	12	10	13	14
9(J)	3	P4	6	7	1	8	9
10(K)	3	P4	2	3	1	4	5
11(L)	3	P5	15	16	10	17	18
12(M)	3	P5	11	12	10	13	14



LIMITATIONS:
TBSS CONTAINS TWO SLOTS (P4 AND P5).
ONE SLOT HAS ROOM FOR ONE ADAPTER.
ONE ADAPTER HAS TWO SERIAL LINES OF THE SAME FORMAT (RS422/RS232 OR CURRENT LOOP).

NOTE 1:
SERIAL LINE ADAPTERS RS422/RS232/CURRENT LOOP, TO BE MOUNTED IN SLOTS IN TBSS DEPENDING ON SYSTEM CONFIGURATION.

NOTE 2:
IF A TRIPPLE SYSTEM ARE USED, INTERNAL CONNECTION IS EXTENDED FROM THE THIRD COMPUTER, AND CONNECTED TO ALL TBSS ON P3, AND PLUGGED THE SAME WAY AS SYSTEM A AND B.

MARKINGS:
ALL CONNECTORS, CABLES & COMPONENTS SHOULD BE MARKED IN ACCORDANCE WITH: MARKING & LABELLING SPECIFICATION, 848-161013

LOOP TYPICAL: SL 001(RCU 500)

REV.	DATE	REASON FOR ISSUE	PREPARED	CHECKED	APPROVED
B	03.02.06	Reissued	EH	KUW	TF
A	20.10.04	FIRST ISSUE	EH	RI	TF

KONGSBERG SIMRAD

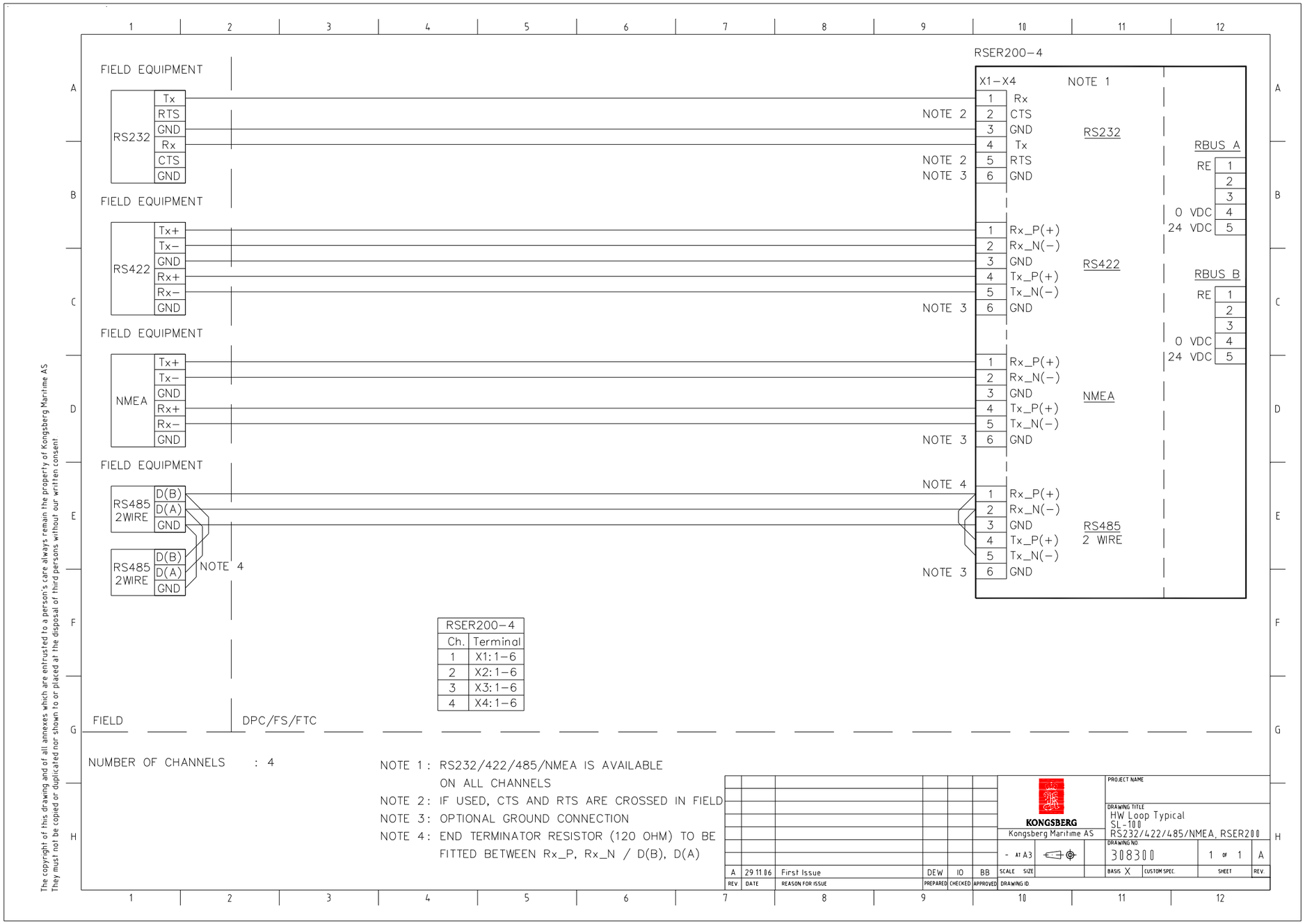
PROJECT NAME

DRAWING TITLE: LOOP TYPICAL SL 001 (RCU 500) TBSS

DRAWING NO: 508077 | 1 of 1 | B

SCALE - AT A3 | SIZE | BASIC X | CUSTOM SPEC | SHEET | REV

DRAWING ID


RSER200-4
FIELD EQUIPMENT
RS232
Tx
RTS
GND
Rx
CTS
GND
NOTE 2
NOTE 2
NOTE 3
X1-X4
NOTE 1
1 Rx
2 CTS
3 GND
4 Tx
5 RTS
6 GND
RS232
RBUS A
RE 1
2
3
0 VDC 4
24 VDC 5
FIELD EQUIPMENT
RS422
Tx+
Tx-
GND
Rx+
Rx-
GND
NOTE 3
1 Rx_P(+)
2 Rx_N(-)
3 GND
4 Tx_P(+)
5 Tx_N(-)
6 GND
RS422
RBUS B
RE 1
2
3
0 VDC 4
24 VDC 5
FIELD EQUIPMENT
NMEA
Tx+
Tx-
GND
Rx+
Rx-
GND
NOTE 3
1 Rx_P(+)
2 Rx_N(-)
3 GND
4 Tx_P(+)
5 Tx_N(-)
6 GND
NMEA
FIELD EQUIPMENT
RS485 2WIRE
D(B)
D(A)
GND
RS485 2WIRE
D(B)
D(A)
GND
NOTE 4
NOTE 4
NOTE 3
1 Rx_P(+)
2 Rx_N(-)
3 GND
4 Tx_P(+)
5 Tx_N(-)
6 GND
RS485 2 WIRE
RSER200-4
Ch. Terminal
1 X1:1-6
2 X2:1-6
3 X3:1-6
4 X4:1-6
FIELD
DPC/FS/FTC
NUMBER OF CHANNELS : 4
NOTE 1: RS232/422/485/NMEA IS AVAILABLE ON ALL CHANNELS
NOTE 2: IF USED, CTS AND RTS ARE CROSSED IN FIELD
NOTE 3: OPTIONAL GROUND CONNECTION
NOTE 4: END TERMINATOR RESISTOR (120 OHM) TO BE FITTED BETWEEN Rx_P, Rx_N / D(B), D(A)
A 29.11.06 First Issue DEW IO BB
REV. DATE REASON FOR ISSUE PREPARED CHECKED APPROVED
KONGSBERG
Kongsberg Maritime AS
PROJECT NAME
DRAWING TITLE
HW Loop Typical
SL-100
RS232/422/485/NMEA, RSER200
DRAWING NO
308300
- AT A3
SCALE SIZE
1 OF 1
A
BASIS X
CUSTOM SPEC.
SHEET
REV.
DRAWING ID
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